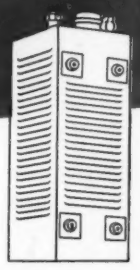
MINING CONGRESS JOURNAL

APRIL, 1940

STEEL MULES COST LESS PER TRIP (and less per year)



Look at mine haulage from the dollars and cents point of view. How much less does it cost to use the "Steel Mule" invented by Mr. Edison—the steel-alkaline battery? This battery is so entirely different that it costs less than any other on almost every score. How much would it save you?

Figure on less depreciation per year over its long service life. Figure the elimination of almost all maintenance during idle periods. Figure on depreciation at practically a standstill during idle periods (the Edison doesn't age during idleness). Figure on the elimination of all haulage delays caused by sudden battery failure. Figure on low off-peak current rates (the Edison can take fast charging). The total of these savings gives you an idea of how much less the Edison costs.

EDISON

STORAGE BATTERY

DIVISION OF THOMAS A. EDISON, INC. WEST ORANGE, NEW JERSEY, U. S. A.

OFFICIAL

You can stop the

POWER LEAKS *by* WELDING

YOUR MAIN HAULAGE TRACK

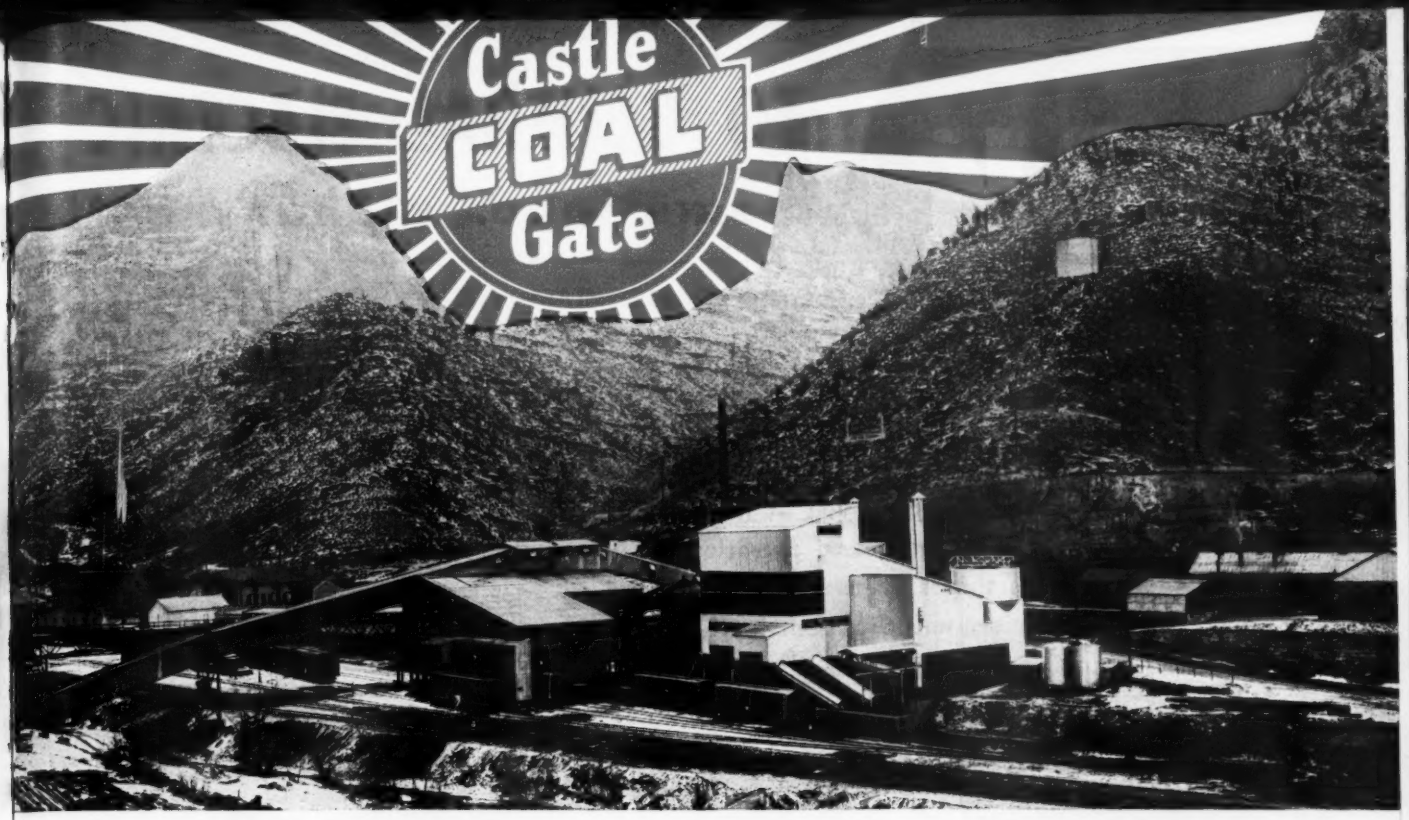
● Thermit welded track does away with power leaks at rail joints because rail bonds are eliminated and there can be none of the usual losses that occur with broken, loosened or corroded bonds. The Thermit weld has all of the electrical conductivity of the rail itself and this conductivity is permanent and as long-lasting as the life of the rail.

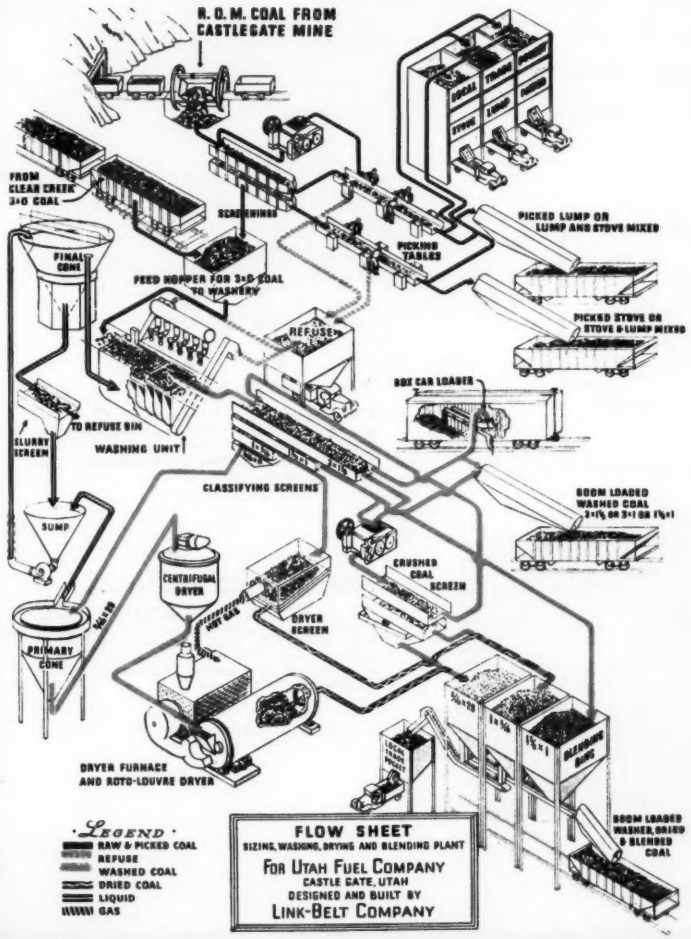
Continuous rail can be installed on main haulage lines, by the Thermit process, with minimum interruption to normal operating conditions. Your present track crew can easily be trained to do the work. Send for further particulars, or ask to have a representative call and explain the advantages of welded rail and the simplicity of Thermit Rail Welding.

THERMIT Rail WELDING

METAL & THERMIT CORPORATION • 120 BROADWAY, NEW YORK
ALBANY • CHICAGO • PITTSBURGH • SO. SAN FRANCISCO • TORONTO

For better results in electric arc welding, investigate MUREX line of HEAVY COATED ELECTRODES including especially designed rods for building up and hard surfacing.





UTAH FUEL STEPS OUT
for New Markets—New Profits with LINK-BELT Coal Preparation

The latest contribution to the progress of the bituminous coal industry, is this new Link-Belt preparation plant of the Utah Fuel Co., formally opened on February 24th, at Castlegate, Utah. As Mr. Moroni Heiner, president, said during dedication ceremonies, "It is tangible evidence of our faith in the future of coal, the world's greatest source of heat and energy."

The new plant, shown to the right, above, combines in one well-integrated unit, the most modern methods of cleaning, sizing, drying and blending for the production of coal of finest quality and uniformity at lowest cost.

With an initial capacity of 250 t.p.h. of 3″ x 0″ raw coal, provisions have been made for the future installation of additional washing and drying equipment to increase the capacity to 400 t.p.h.

Whatever you need to improve the quality and uniformity of your coal—a complete tipple, wet or dry cleaning plant, or some additional unit or replacement part, Link-Belt has the experience and facilities to assist you in arriving at the lowest cost way of accomplishing the desired result.

Link-Belt Company, Chicago, Philadelphia, Pittsburgh, Wilkes-Barre, Huntington, W. Va., Kansas City, Mo., Cleveland, Detroit, St. Louis, Seattle, Toronto, Vancouver. 8040

King Coal Say:
"Get wise—Modernize!"

SEE OUR EXHIBIT
1940 COAL SHOW
CINCINNATI, OHIO,
APRIL 29 — MAY 3

LINK-BELT HANDLING PREPARATION EQUIPMENT

LOOK TO GENERAL ELECTRIC

. . . . . That meet

D-C MOTORS

THE G-E direct-current motors and control shown here can be a real help to you in meeting the special requirements of mechanized operation. They have those features that are essential to successful operation in coal mines and thus contribute to continuous, low-cost production. Furthermore, the different types available enable you to cope with a variety of conditions.

Look them over and see which types most nearly meet *your* requirements. Our nearest representative will be glad to give you further information. Remember that, even when buying through an equipment manufacturer, you can get G-E motors and control just by SPECIFYING GENERAL ELECTRIC.

General Electric, Schenectady, N. Y.

EXTRA! EXTRA!

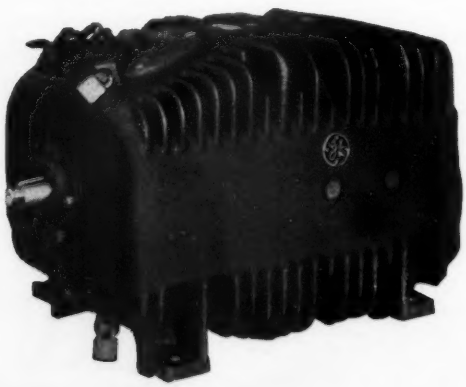
See the G-E direct-current motors and control on display at the American Mining Congress in Cincinnati! General Electric exhibit, Booths 417 and 423. Drop around any time.

FOR WET MINES

G-E Type B, dripproof, semienclosed, with ball-bearings. Provides the advantages of long bearing life, excellent commutation, a highly protective insulation with remarkable bonding qualities, easily accessible brush rigging, and a convenient lubrication system.

FOR GASSY MINES

G-E totally enclosed, fan-cooled, Class BM d-c motor. Complete enclosure provides the additional advantage of protection against dust and moisture. Improved design increases accessibility of brush rigging.



FOR LOADING MACHINES

G-E Type CY302, totally enclosed, Class BM. Meets low-height requirements of loading machines and similar mining units. External-fin construction facilitates rapid heat dissipation and, therefore, assists in effective cooling. You won't find a tougher motor than this one!

GENERAL

FOR DIRECT-CURRENT MOTORS and CONTROL

the severe requirements of mining service

NOTE THE LONG-LIFE, LOW-MAINTENANCE FEATURES OF A TYPICAL G-E DIRECT-CURRENT MOTOR*

*Type B, 284 frame

THE FRAME Rolled steel, bored throughout its length. The 360-degree rabbet fit maintains accurate concentricity and alignment of end shields.

FIELD COILS Held firmly in place, assuring freedom from chafing that may cause breakdown. G-E bonding varnish cements the coils into a solid mass. High resistance to foreign matter prolongs life of the windings.

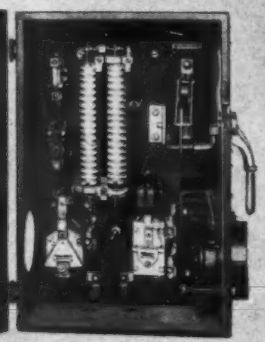
END SHIELDS Provide mechanical protection and rigid bearing support. End-shield openings can be readily covered with flat plates or perforated covers.

ARMATURE Shaft is readily removable. Form-wound, pretreated coils with mica tubes around slot portion. Coil insulation is heat- and moisture-resisting, tough, and flexible. Commutator is built up of copper segments.

BRUSH RIGGING Brush yoke is clamped in position and easily adjustable. Brush holders are easily adjusted to maintain proper setting.

BALL-BEARING ASSEMBLY Cartridge-type ball bearings exclude dirt even when the motor is disassembled. Convenient pressure-gun fitting and relief plug permit lubrication and flushing of bearings without motor shutdown.

D-C CONTROL



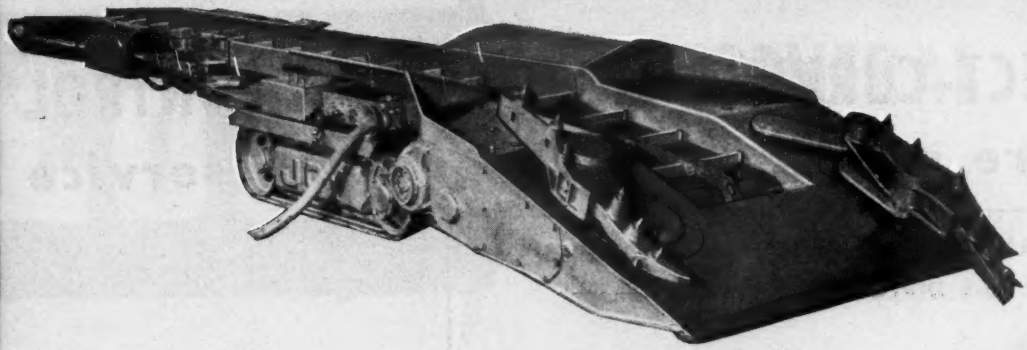
FOR WET MINES

G-E Type CR4061-C1B mine-type d-c starter. Corrosion-resisting features are the heavy copper-bearing-steel enclosure and the cadmium plated devices. Thermal overload relay and instantaneous overload relay provide motor protection. Push-button operated.

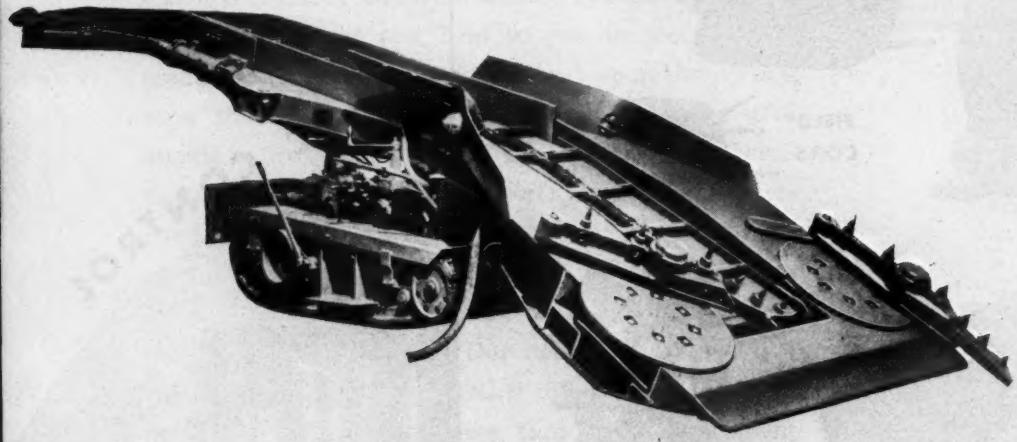
FOR GASSY MINES

G-E Type CR4850 enclosed mine-type d-c starter built to Bureau of Mines specifications. Note the hand-hole cover that facilitates inspection of operating devices. Dusttight enclosure is of fabricated-steel construction and has a non-corrodible finish.

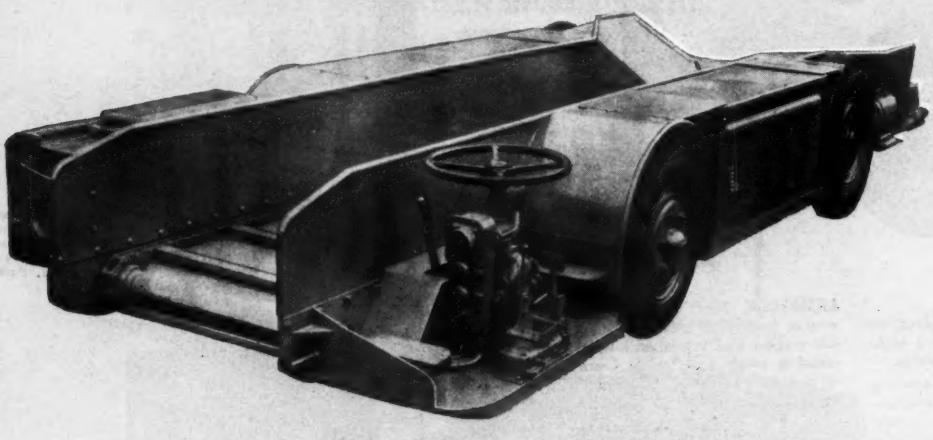
E L E C T R I C



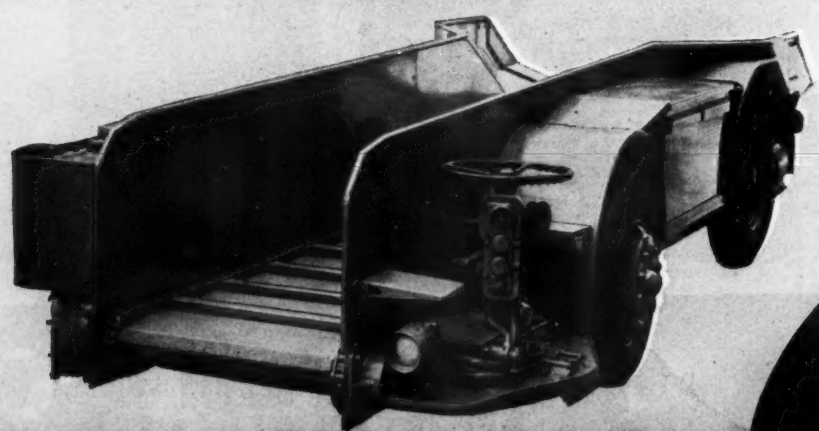
JOY
14-BU Loader
A high capacity low vein machine only 26" high 5 Tons per minute.



JOY
11-BU Loader
A heavy duty machine of high capacity 8-10 tons per minute.



JOY
32 inch
Shuttle Car
3½ ton capacity
for low seam operations.



JOY
42 inch
Shuttle Car
6 ton capacity
for high seams.

JOY

JOY says:

See the ultimate in modern mechanization

at Cincinnati in Booth 420-629

King Coal Say:
"Get wise—Modernize!"

VISIT THE JOY DISPLAY OF MOBILE LOADERS AND SHUTTLE CARS

Here's low cost secondary haulage developed to a new standard of efficiency.

Discuss ways and means of reducing your face and section costs with a JOY Engineer at the booth.

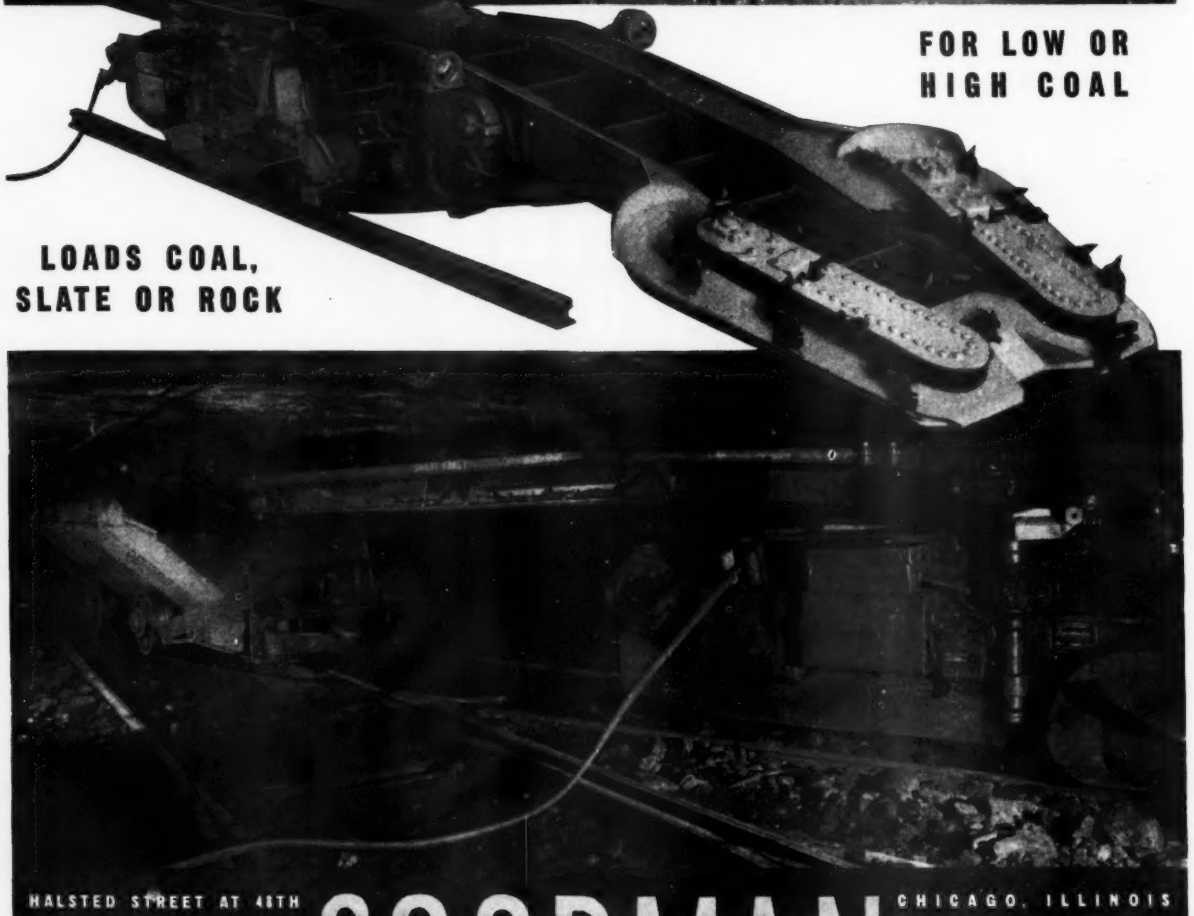
MANUFACTURING COMPANY

Franklin...Pennsylvania

THE GOODMAN 360 TRACK TYPE LOADING MACHINE

FOR LOW OR HIGH COAL

LOADS COAL, SLATE OR ROCK



HALSTED STREET AT 48TH

CHICAGO, ILLINOIS

LOCOMOTIVES
COAL CUTTERS

GOODMAN

LOADERS
CONVEYORS

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PITTSBURGH • HUNTINGTON

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MANUFACTURING COMPANY

R & P CLEANS COAL the R & S WAY

Cleaning plant showing loading terminal and belt conveyor from revolving dump, approximately 1,000 feet away.

NEW Tipple and Air Cleaning plant of Rochester and Pittsburgh Coal Co., of Indiana, Pa., at Waterman Mine, Homer City, Pa. Capacity of tipple 300 tons R.O.M. per hour. Capacity of Stump air cleaning plant 125 tons per hour. Cleaning ¾ x 0 slack—loading ¾ x ¼ and ¼ x 0 coals.

SEE US AT CINCINNATI
BOOTHS 610-12-14

Tipple houses R & S Revolving Dump—Sizing Screen, and Bradford Breaker.

Other Large Tonnage Users of Stump Process Are:

Bell and Zoller Coal Mining Co.....Zeigler, Ill.
Berwind-White Coal Mining Co.....St. Michael, Pa.
Heisley Coal Co.....Nanty Glo, Pa.
Island Creek Coal Co.....Holden, West Va.
Monroe Coal Mining Co.....Revloc, Pa.
Pickands Mather & Co.....Mather, Pa.
Pittsburgh Coal Co.....Negley, Ohio
Westmoreland Mining Co.....Blairsville, Pa.

Of All Air Cleaning Plants Built During Last Five Years 90 Percent Have Employed Stump Process

R & S Revolving Dump—Capacity of mine car ten tons.

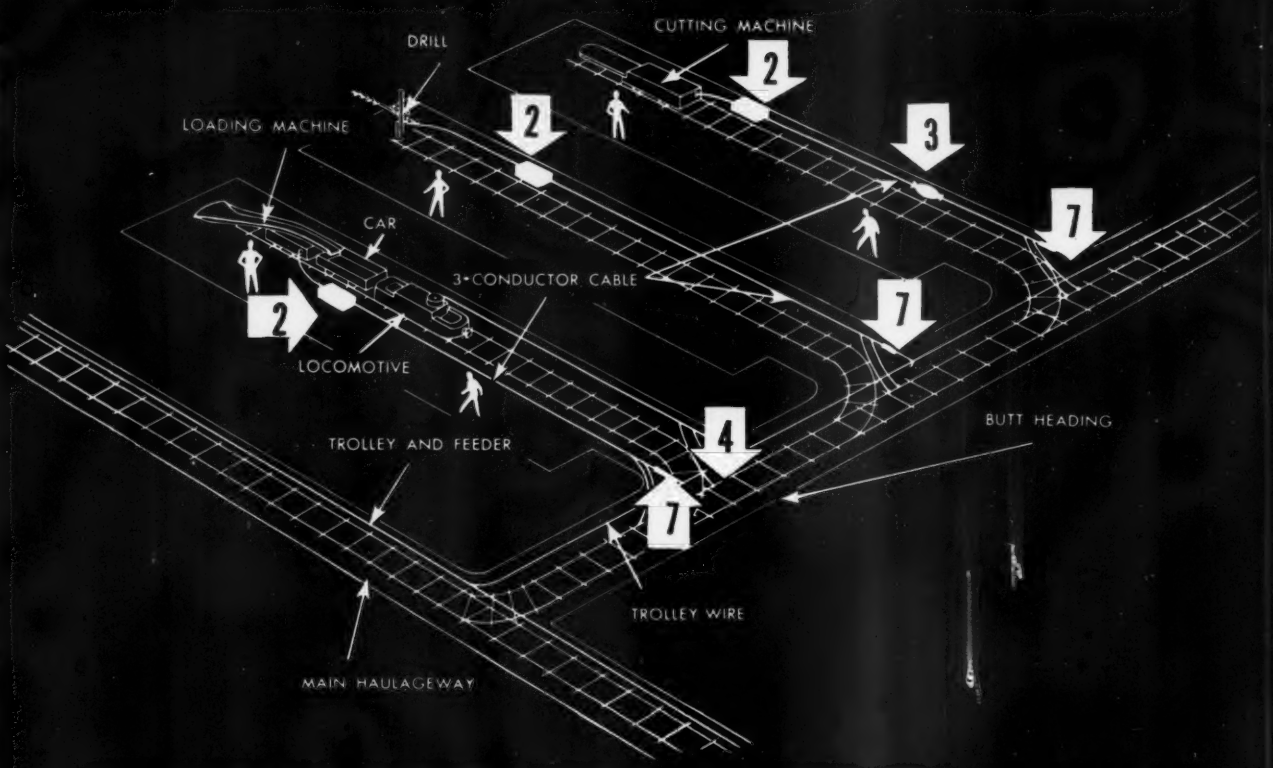
(Right) Cleaning floor showing R & S Stump air flow units.

ROBERTS and SCHAEFER CO.
Engineers and Contractors 307 N. Michigan Ave., Chicago
P. O. Box 865 PITTSBURGH, PA.
P. O. Box 570 HUNTINGTON, W. VA.

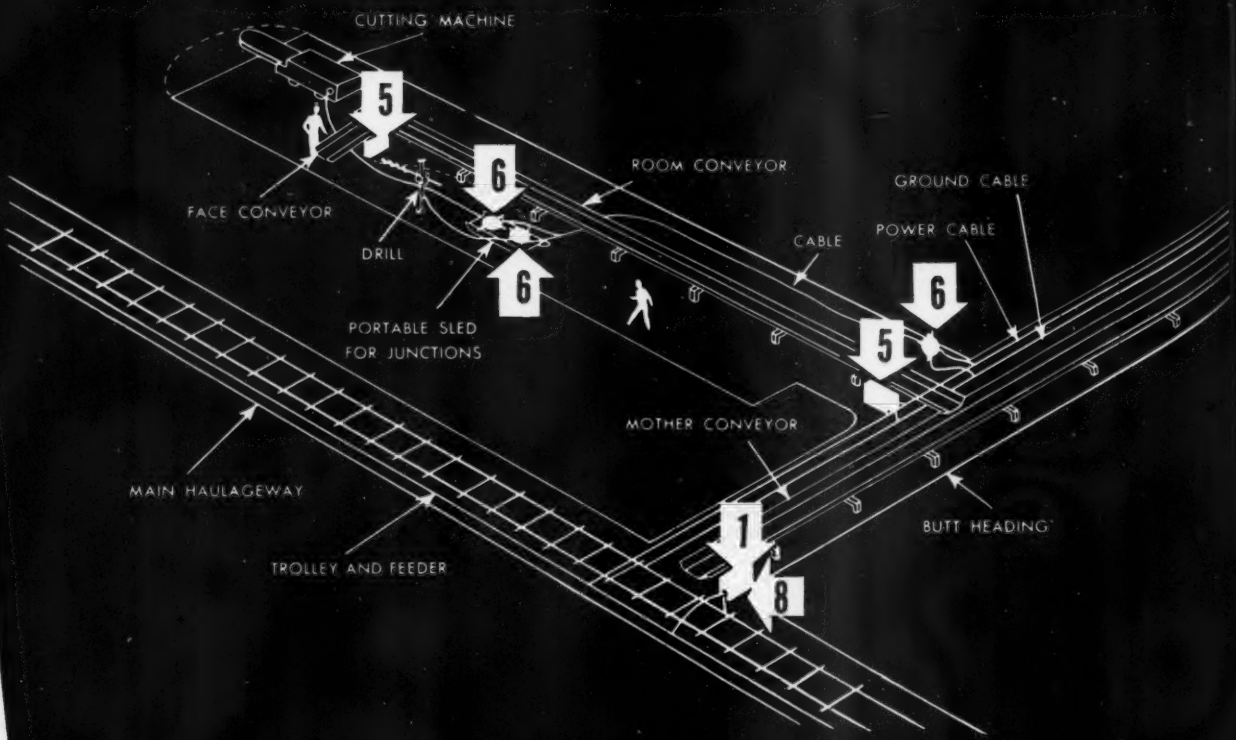
TIPPLES
COAL WASHERIES Types to suit your requirements
COAL CLEANING BY AIR PROCESS
COMBINATION WET AND DRY CLEANING PLANTS
DEDUSTING PLANTS
REVOLVING DUMPS
CAR FEEDERS
COAL (heat) DRYERS

Your investigation of mechanized

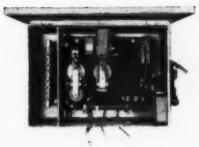
O-B EQUIPMENT FOR TROLLEY HAULAGE



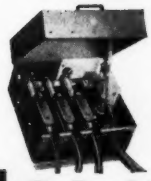
O-B EQUIPMENT FOR CONVEYOR SYSTEMS



mining is not complete until you have inspected



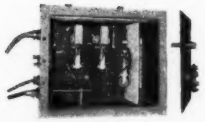
Type KAD and AD Automatic D. C. Motor Starters control and protect your conveyor, fan, pump, shop and tipple motors.



The Type B Interlocking Multiple Junction provides connection facilities and fuse overload protection for three circuits at the face. Connections cannot be made with the current on.

The new Cable Junction Plug for connecting three-conductor trailing cables eliminates unprotected cable splices and speeds up cable connections.

The Plier Type Ground Clamp quickly and conveniently clamps over rail bond cable or rail base when ground or return circuit connection is required.



The Type ADG Explosion-Proof Automatic D. C. Motor Starter is designed for protecting and controlling conveyor, pump and fan motors in gaseous territory.

The Permissible Fused Gas-Tight Junction Box provides a safe, fool-proof means for connecting trailing cables in gaseous areas.

O-B Fused Trolley Taps provide positive protection against abusive and costly overloading of cables and machine motors.

The Triple Pole Connector facilitates "power-off" motor starter and motor connections at the face.

GET THE WHOLE PICTURE AT THE O-B EXHIBIT, SPACES 500-506

So much of the performance efficency of your contemplated mechanization program will depend on comparatively inexpensive subsidiary equipment such as motor controls, connection devices and fused trolley taps that you cannot afford to ignore a careful analysis of this type of correlated equipment, as you investigate the various aspects of mechanized mining.

When you visit the mining show at Cincinnati this year, make it a point to complete your investigation by inspecting O-B Control Equipment at the O-B exhibit, spaces 500-506!

MANSFIELD OHIO · U·S·A

Canadian Ohio Brass Company, Ltd · Niagara Falls, Ont., Canada

Let's Talk Over the Profit Possibilities of Cardox in Relation to Your Mechanization Plans When We Get Together

AT CINCINNATI–APRIL 29

The American Mining Congress

The Cardox Exhibit will include a 4-Ton capacity Low Pressure Cardox Charging Plant and complete line of Cardox Tubes. Full, conclusive evidence of *lower production cost, increased realization,* and *greater safety* with Cardox, can be shown to visitors.

SEE US AT

BOOTHS 630-32-34-36

CARDOX CORPORATION

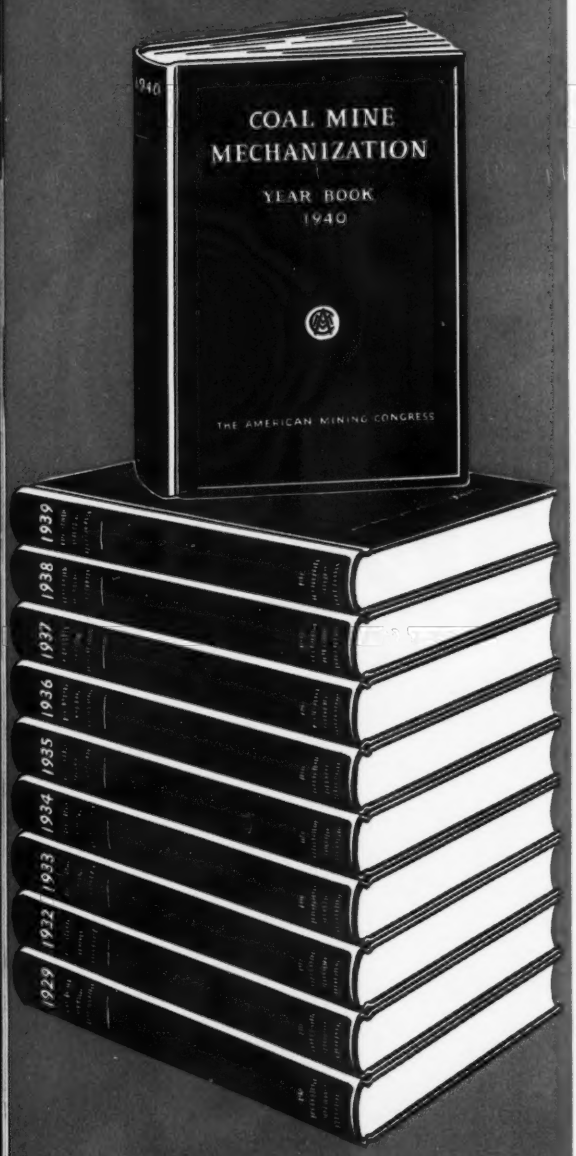
Goes Hand in Hand with CARDOX

46 of the Last 50 Mines to Adopt Cardox had also Undertaken a Mechanization Program

Get the facts now—a survey and test at your mine, can be arranged without cost or obligation. Write, wire or phone today.

• BELL BUILDING • CHICAGO

'THE BOOK OF THE YEAR'- 1940 Vol.



King Coal Say:

"TOPS 'em All"

An up-to-date, down-to-earth Compendium of Coal Mining's Best Practice and Thought

TO LIGHT YOUR WAY

EVERY COAL MINING MAN needs this volume. It's the "last word" about what is being done—and HOW it is being done—throughout the industry. Between the covers are the reports, findings and actual experiences of coal men in every branch of operation . . . fine descriptions of the most modern methods which are being developed to lower production costs and improve quality . . . the complete papers and discussions of the 1940 Coal Convention . . . photographs and descriptions of the Miners' Exhibit . . . and a full review of the reports of the Coal Division of the American Mining Congress.

It's a book that the forward-looking coal executive or operating man will want both in his office and home. An indispensable digest of up-to-the-minute information he will be anxious to have AS EARLY AS POSSIBLE!

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6¼ x 9 inches; approximately 375 pages; fully illustrated from cover to cover. A gold mine of latest information on such subjects as Mechanical Loading, Conveyor Mining, Surface Preparation, Equipment Maintenance, Safety, Face Preparation, Power Distribution, Roof Support, Strip Mining, Coal Utilization, Economic Problems, etc.

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1-4 copies	$2.00 each
5-9 copies	1.75 each
10-14 copies	1.60 each
15 or more copies	1.50 each

AMERICAN MINING CONGRESS

309 Munsey Building — Washington, D. C.

Don't let Dust thumb a ride

DUST is the hitch-hiker that causes trouble in the coal business and drives customers to oil, gas, and electricity. But dust is unnecessary. Now it is possible to get rid of approximately 95% of all perceptible dust by spraying coal with a solution of

Coaladd

Coaladd is nothing but that tried and successful mine treatment, Coalaid, in a new form. Coaladd is in the form of dry granules, packed in hundred-pound, weather-proof paper bags. Mixed with water, it becomes the same as Coalaid.

Coalaid can be used economically only in tank-car lots by large mines. Coaladd can be used by the smallest mine or the smallest retail coal yard. Coaladd does not creep out of the coal. It does not stain. It has no obnoxious odors. It does not affect the combustion. It does not corrode iron or harm rubber or compound belting. And the treatment lasts until the coal is burned. It is backed by an elaborate campaign of dealer helps which sell the dustless coal idea to the consumer.

With Coalaid for the large mines and Coaladd for small mines and retail dealers, the coal industry can keep Dust from thumbing a ride.

Send for a demonstration kit that proves *the effectiveness of Coaladd.*

King Coal Say:

"Remove the dust and you'll move the coal."

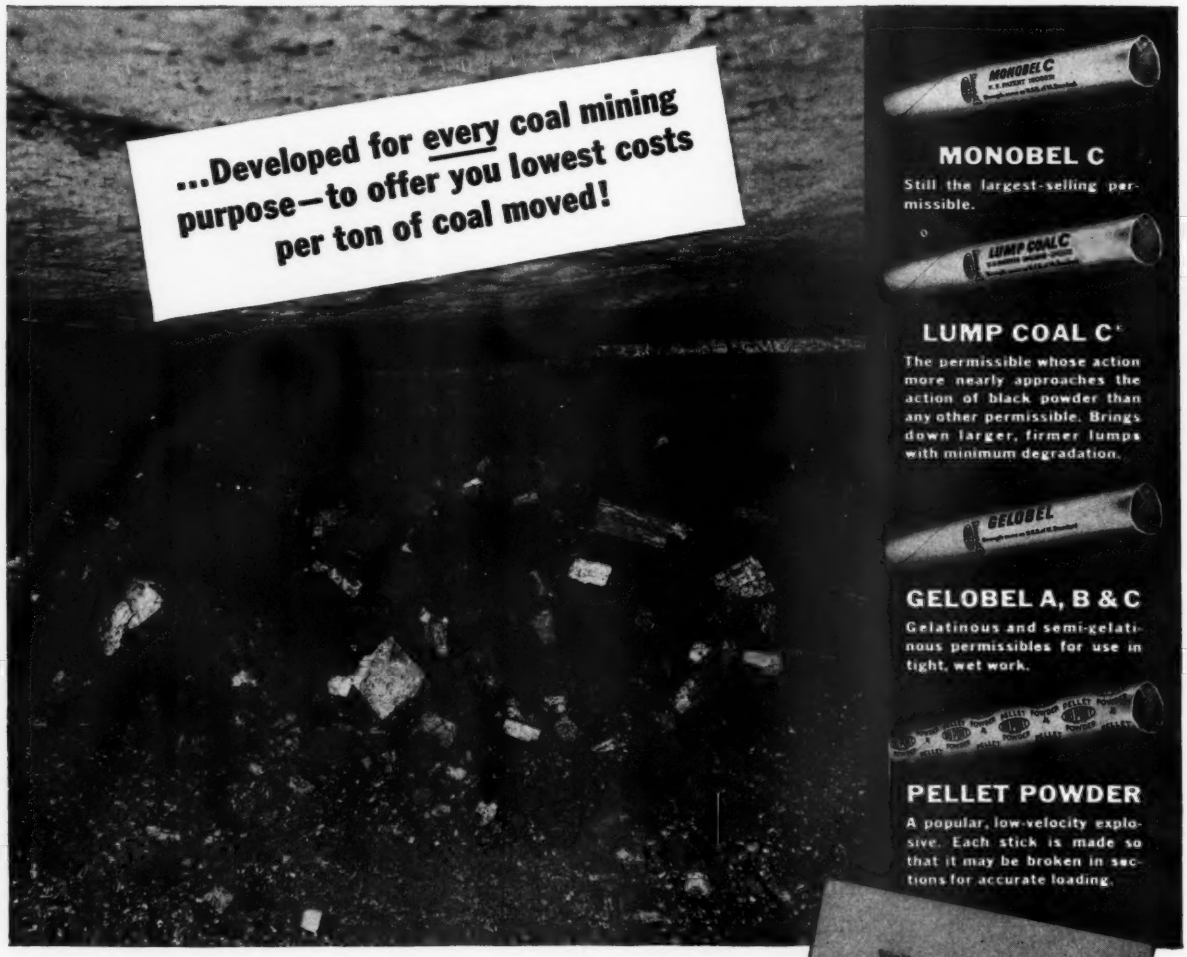
SEALED Coaladd PROTECTION

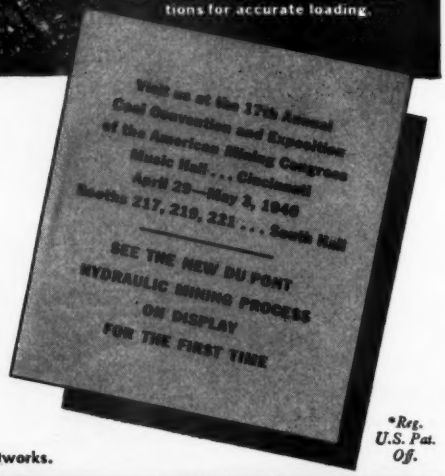
The Johnson-March Corporation

52 VANDERBILT AVE., NEW YORK CITY

Coaladd is manufactured for Johnson-March and distributed nationally by The Dow Chemical Company, Midland, Mich.

DU PONT EXPLOSIVES


...Developed for every coal mining purpose—to offer you lowest costs per ton of coal moved!
MONOBEL C
Still the largest-selling permissible.
LUMP COAL C*
The permissible whose action more nearly approaches the action of black powder than any other permissible. Brings down larger, firmer lumps with minimum degradation.
GELOBEL A, B & C
Gelatinous and semi-gelatinous permissibles for use in tight, wet work.
PELLET POWDER
A popular, low-velocity explosive. Each stick is made so that it may be broken in sections for accurate loading.


Visit us at the 17th Annual Coal Convention and Exposition of the American Mining Congress
Music Hall . . . Cincinnati
April 29—May 3, 1940
Booths 217, 219, 221 . . . South Hall
SEE THE NEW DU PONT HYDRAULIC MINING PROCESS ON DISPLAY FOR THE FIRST TIME

FOR 138 YEARS, Du Pont has been developing, testing, and manufacturing explosives. Since 1802, Du Pont's purposes have been to help you produce the most marketable coal at the lowest possible costs.

Just as coal mining methods have improved since 1802, so have Du Pont Explosives. Today, when you use Du Pont Explosives, you use products that show the results of 138 years' experience... explosives that offer you lowest costs per ton of coal moved.

In addition, Du Pont offers you the technical assistance you may require on any blasting problem—to assure your getting the full benefits of Du Pont dependable performance. E. I. du Pont de Nemours & Co. (Inc.), Explosives Dept., Wilmington, Delaware.

*Reg. U.S. Pat. Off.

DU PONT ON THE AIR—Listen to "Cavalcade of America" Tuesdays, 9 p. m. E. S. T., N B C networks.

DU PONT REG. U.S. PAT. OFF. **PERMISSIBLES**

SAFETY

FOR MEN . . .

SAFETY FOR MONEY

Coal operators who have standardized on Roebling "Blue Center" Wire Rope use it because the test of time has proved that (1) it provides the utmost of protection against accidents; (2) it protects their pocketbooks by assuring lowest rope cost per ton of coal handled. » The operation of today's mechanized mining equipment, at highest possible efficiency, depends to a large extent on dependable, economical rope service. That's why mechanized mines everywhere are turning to Roebling "Blue Center"

Cincinnati—we will be on hand!

Our eyes are turned toward the 17th Annual Coal Convention and Exposition of the American Mining Congress — in Cincinnati — April 29th to May 3rd. We look forward to this yearly event with pleasure — and to the opportunity to meet again with our many friends in the coal industry. A cordial invitation to you — to visit us in Booth "Lobby N and O".

JOHN A. ROEBLING'S SONS COMPANY
Trenton, N.J. Branches in Principal Cities

ROEBLING

"BLUE CENTER"

WIRE ROPE

A ROPE THAT ASSURES

1 *Maximum Safety*

2 *Lowest Rope Cost per ton of Coal handled*

OTHER ROEBLING PRODUCTS INCLUDE
Electric Wire & Cable, Cableways & Tramways, Trolley Wire & Cable, Galvanized Steel Strand, Screen Cloth, Wire Rope Slings & Fittings, Welding Wire & Cable

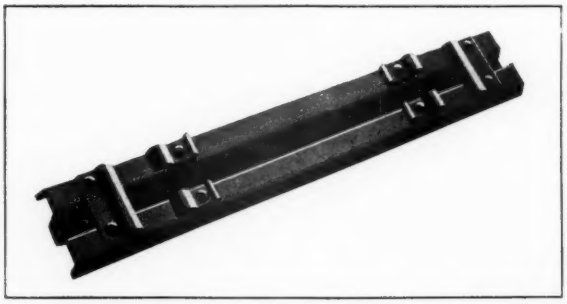
MECHANIZATION

calls for better track

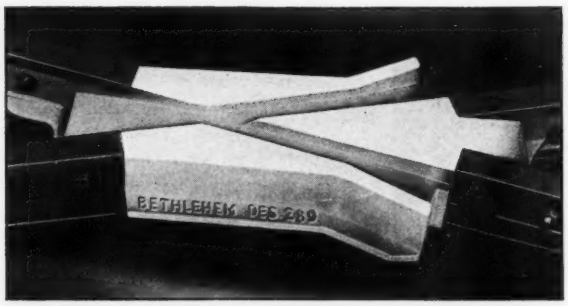
When you've tied up important money in mechanical loading equipment, you want to keep that equipment working full time.

This means you'll want to improve mine track. You'll want to seriously consider heavy-duty steel ties, particularly for the face and entries; heavy-duty switches, frogs and stands; heavier rail, for rooms to take the heavy machines, for main-haulage track to permit higher speeds with safety.

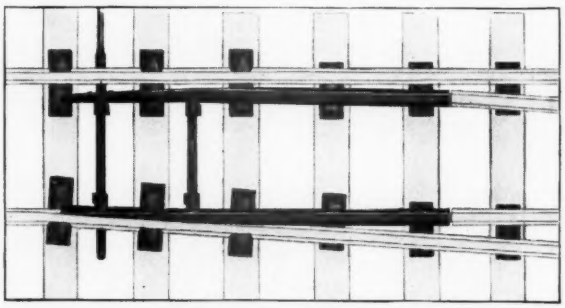
Bethlehem makes a complete line of heavy-duty track equipment. Each item has proved itself in hard service. Each one can do its share in keeping your track-mounted equipment working full time. Detailed, useful information on Bethlehem heavy-duty track materials is in Booklet 72-A. Booklet 71 describes all Bethlehem Mine Ties. A copy of each is yours for the asking. Write Bethlehem Steel Company, Bethlehem, Pa.



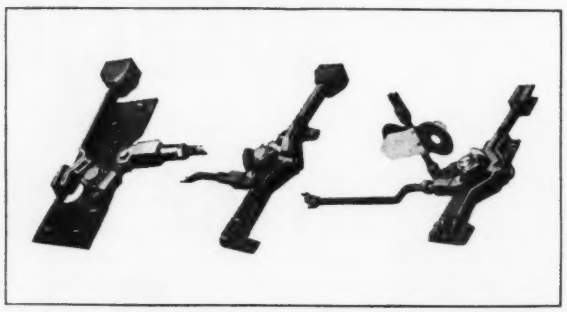
Bethlehem Steel Mine Ties cut track-laying time in half. The heavy No. 4 is rapidly becoming popular in mechanized mines.



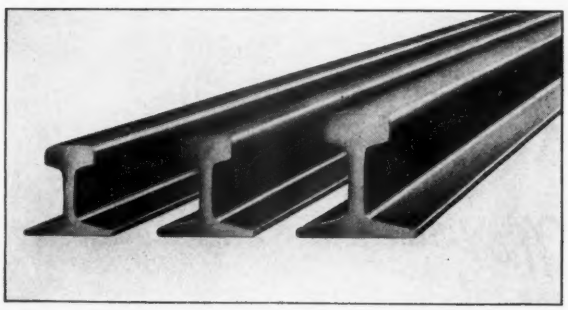
One-piece cast manganese-steel frogs harden under traffic, increase safety and practically eliminate maintenance.



Heavy-duty switches, with extra-weight slide plates and heavy, galvanized braces, have proved over many years the importance of sturdy construction.



Low, self-cleaning, self-locking parallel-throw switch stands increase speed with safety. Three models: 1201 (30-lb. rail), 1217 (up to 60-lb. rail) and 1222 (over 60-lb. rail).



Stepping up rail weights is often economical. 30-lb. for rooms, 40-lb. for secondaries and 60-lb. for main-haulage are minimum recommendations.

BETHLEHEM STEEL COMPANY

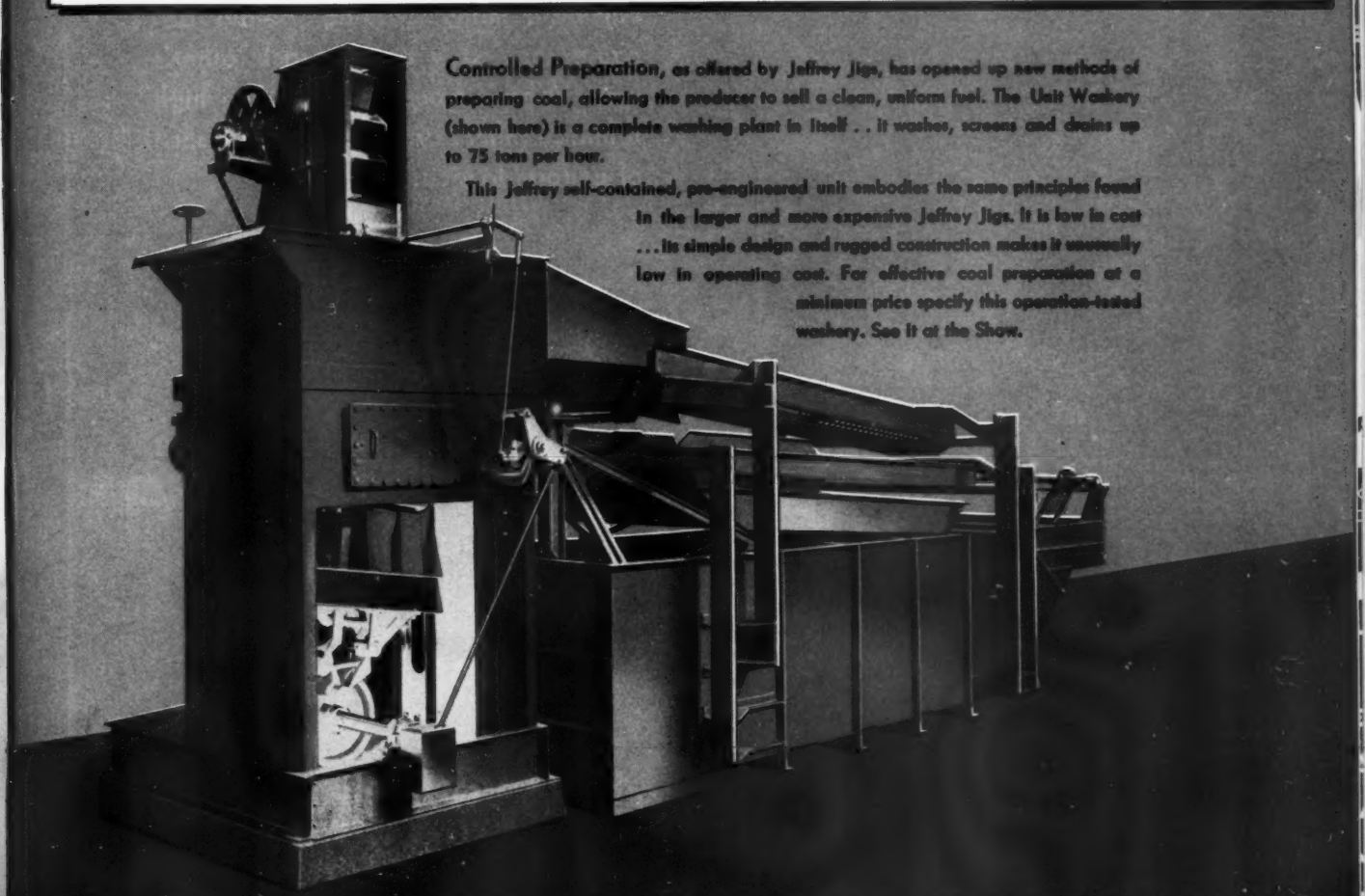
BETHLEHEM STEEL

Your Personal Invitation

TO VISIT THE JEFFREY EXHIBIT
at
THE 1940 CONVENTION
of the
AMERICAN MINING CONGRESS

Laid out to demonstrate in dramatic, graphic fashion how Jeffrey equipment sets a more profitable pace at the face and maintains it throughout every subsequent operation above or below ground . . . you will want to plan an extended visit in Booths 300-320, so you can systematically inspect each piece of Jeffrey equipment.

Here you will get a complete picture of how Jeffrey coordinates sound engineering to do a better job of reducing costs, improving your product and assuring a greater ultimate profit over the years to come. The time you spend with us will, we feel sure, be well invested.



Controlled Preparation, as offered by Jeffrey Jigs, has opened up new methods of preparing coal, allowing the producer to sell a clean, uniform fuel. The Unit Washery (shown here) is a complete washing plant in itself . . it washes, screens and drains up to 75 tons per hour.

This Jeffrey self-contained, pre-engineered unit embodies the same principles found in the larger and more expensive Jeffrey Jigs. It is low in cost . . . its simple design and rugged construction makes it unusually low in operating cost. For effective coal preparation at a minimum price specify this operation-tested washery. See it at the Show.

THE JEFFREY MANUFACTURING COMPANY

912-99 NORTH FOURTH STREET — COLUMBUS, OHIO

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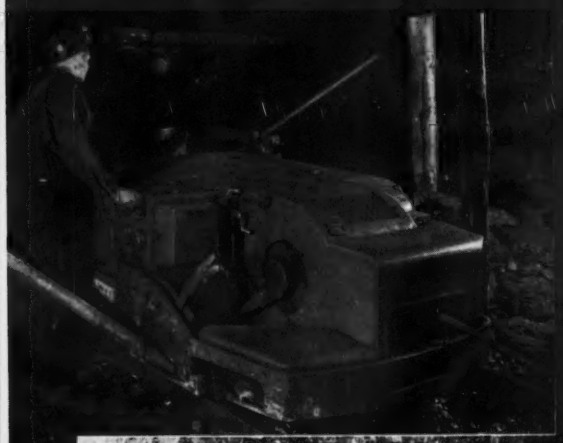
FOR CONVERTING FACE OPERATION INTO SMOOTH ROUTINE

In range, speed and capacity, the Jeffrey 29-U cutter, 56-A driller and the L-400 loader are adapted to work together. All three are track-mounted and highly flexible. Having a fine balance of operating characteristics and requirements, they insure a continuous cycle of production processes . . they eliminate many 'waiting' delays because they stay out of each other's way. What's more, all three are high tonnage units . . your further assurance of uniform low cost.



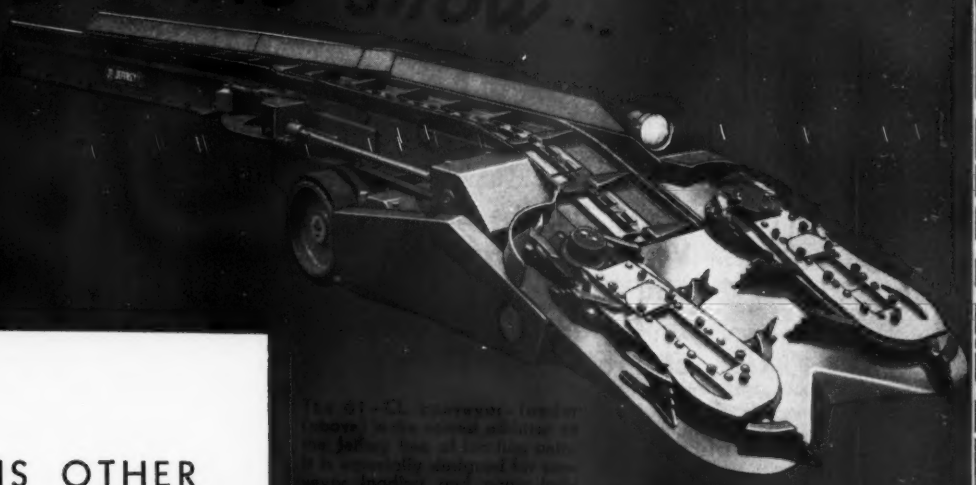
Two views of the Jeffrey 29-U coal cutter are shown above. It is truly a universal cutter with the ability to cut a room to a width of 21'0", make a horizontal cut anywhere from 11" over roll to 81" above, and slope 8° to either side of center line or anywhere between.

Next above is shown the 56-A drilling machine used for fast drilling and properly placed shot holes. Has a wide range of adjustments.

At the right may be seen the Jeffrey L-400 loader, a high capacity unit that sets a new standard in loading machine performance. Jeffrey builds five types of loaders.

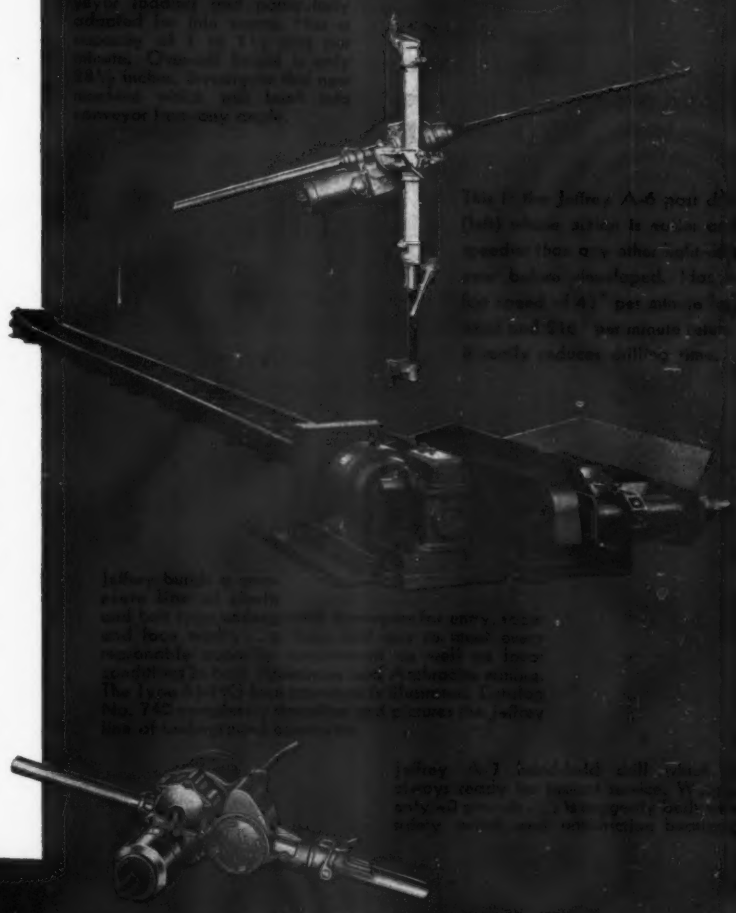
589-38

AT THE MINE SHOW...



...PLUS THIS OTHER OPERATION IMPROVING UNDERGROUND EQUIPMENT

Engineered to coordinate underground operations and fill every 'efficiency gap' that might tend to slow production between face and mine car, this auxiliary equipment... drills, conveyor-loaders and face-room-entry conveyors... serve to complete the picture of profitable production underground. See these units at the Show and let us explain what important contributions they can make to the all-over efficiency of your property.



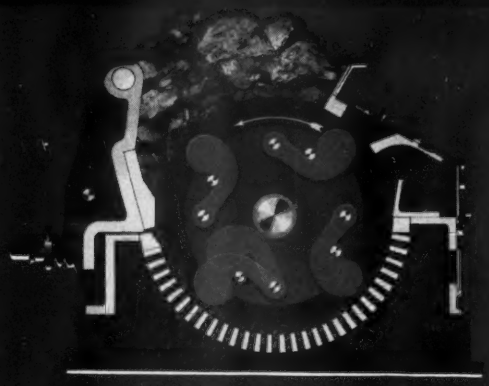
• • • AND

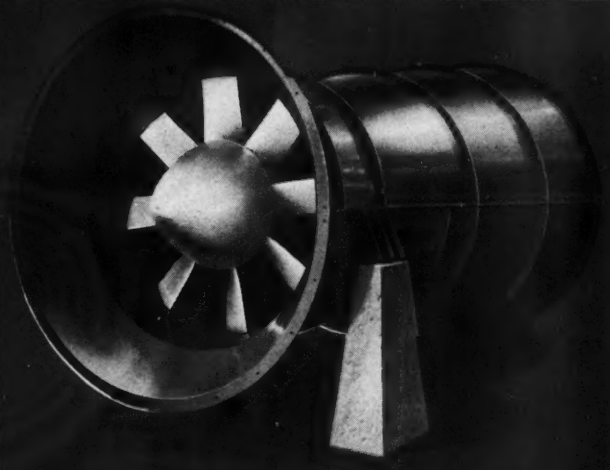
Jeffrey

has the Haulage, Ventilation, Reduction and Sizing Equipment to Complete the Cycle of Profitable Operation

Fans and blowers to improve underground working conditions . . . locomotives in various types and sizes to handle every gathering or haulage requirement . . . crushers and screens for accurate low-cost sizing.

Such equipment as this brings Jeffrey engineered efficiency to all remaining phases of mine operation. Typical examples will be shown in Booths 300-320 along with other mining machinery pictured on the preceding pages. We will welcome your close inspection on a comparative basis during the show . . . or if you will not be "among those present," let us send you illustrated literature on the type of equipment in which you are particularly interested.





THE JEFFREY MANUFACTURING COMPANY

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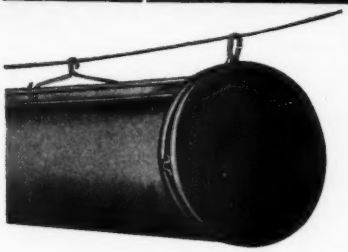

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LOW COST DEPENDABLE VENTILATION is one of the most important problems with which the mining man is confronted in present day mechanized mining.

MineVent FLEXIBLE

WITH the growing use of electrical machinery there are many hazards which have never before been known. The ventilation system which met your requirements yesterday may not be adequate to meet them today.

Modern methods of cutting, gathering, loading, hauling . . . you can not complete the picture unless you have modern ventilation methods.

MINE VENT sales are constantly increasing because leading mining engineers are recognizing it as the most efficient flexible tubing for blowing purposes.

For further information we suggest that you drop in at Booth 539 at the Coal Show. We have something that you will want to see!

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WARSAW, IND., U.S.A.

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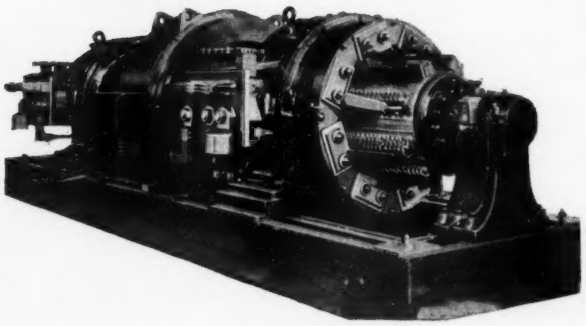
PERFECTED PERFORMANCE

Twenty-six years of successful service on all types of electrical machinery by a company built by successful carbon men with many more years of experience behind them.

SUPERIOR CARBON BRUSHES—manufactured completely in our own plant from the raw materials into nearly one hundred different grades—supplied to twenty-one motor manufacturers as standard equipment.

The mining fields are serviced through reliable supply houses who carry a complete stock of Superior carbon brushes in the field.

If you have a particularly difficult commutation problem write the Engineering Department.



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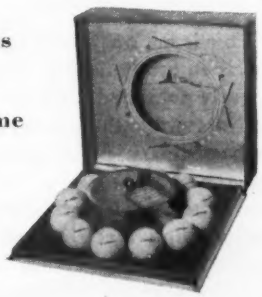
TRADE MARK
NAME ME
AND WIN A PRIZE
MANUFACTURERS OF WIRE · CABLES · TAPE
The U. S. Rubber Wire Man will meet all comers . . . Booth 138 . . . at the American Mining Congress Coal Convention and Exposition, Cincinnati; April 29th to May 3rd.

— Here's what to do to Win!

Register at the U.S. Rubber Company Booth...No. 138, at the Cincinnati Coal Show. Write your suggestion for the U.S. Rubber Wire Man's name—along with your own name and address—on the **you will receive at our booth. The prize-winning name for our U. S. Rubber Wire Man wins a box of twelve True Blue U. S. Royal Golf Balls with a little home putting game—**

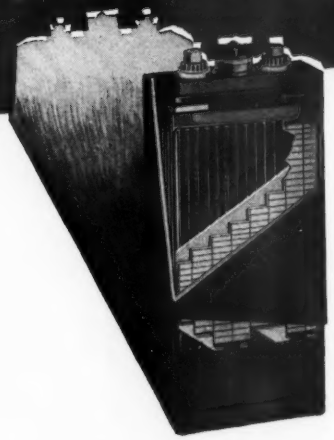


U.S. ROYAL MINING MACHINE CABLE

UNITED STATES RUBBER COMPANY
Rockefeller Center, New York

(All names submitted in this contest are to remain the property of United States Rubber Company.)

MORE AND MORE BUYERS ARE LOOKING BACK OF THE PRODUCT WHEN THEY BUY



MOST storage batteries look very much alike—on the outside. With jars of black rubber and painted trays of wood or steel, even Exides look very little different from others. And if Exide develops a new size or type, such as the TLM, the ML, the FLM, and the MEH types, it is not many months before other manufacturers have a size to meet the Exide rating.

But what really matters are the things you seldom see—what is inside a cell, and what is back of the product.

Inside an Exide-Ironclad cell you will find a real difference. The construction of an Exide-Ironclad positive plate is unlike that of all others in this country. The active material of the plate is contained in hard rubber tubes slotted horizontally to permit free access of the electrolyte. 12½% more plate surface is exposed to the action of the electrolyte than in the regular flat pasted plate construction of the same dimensions.

This is but one advantage. The active material is so firmly held in place and its loss so greatly retarded that the Exide-Ironclad delivers two to three times the life of a battery with ordinary plate construction. All the inherent advantages of the regular type of lead battery are fully retained—its high power ability, high electrical efficiency, and low internal resistance, with great ruggedness and dependability in addition. Only the Exide-Ironclad can give you all these advantages.

Looking further, you see the company behind the battery, a company that is one of America's great institutions. Started 51 years ago with a small plant and an organization of five men, it consists today of vast factories with many acres of floor space and of assembling plants in principal cities the country over. It is a company grown to be the largest of its kind in the world because of the genuine merit of its products and its reputation for fair dealing.

It has always been devoted exclusively to the manufacture of one product—storage batteries—and its foundation policy has been to build its product for each class of service with the full measure of excellence that its long experience and ample resources could provide.

Behind the product also is a nation-wide service organization, which does not wait for you to call on it, but makes regular and frequent visits to plants in which Exides are used, with the purpose of insuring you the utmost in performance and the longest possible life from the battery.

Today, more and more buyers are looking back of the product before they buy. That is why more and more buy Exide. When you need a battery, don't base your selection on outside appearance only. Look behind it as well as inside—and you, as have thousands of others, will see why your new battery must be an Exide. *Exide Exhibit, Space 633, American Mining Congress, Cincinnati.*

Exide
IRONCLAD BATTERIES
With Exide **MIPOR** Separators
"MIPOR," Reg. U. S. Pat. Off.

THE ELECTRIC STORAGE BATTERY CO.
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The World's Largest Manufacturers of Storage Batteries for Every Purpose
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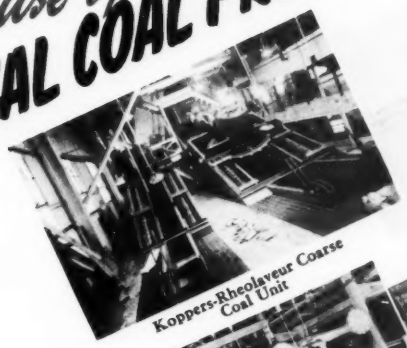
Every Phase of ECONOMICAL COAL PREPARATION

COARSE COAL PLANTS



Koppers-Rheolaveur Coarse Coal Unit

Koppers-Menzies Cone Separators

Koppers-Rheolaveur Fine Coal Unit

Koppers-Battelle Fine Coal Unit

FINE COAL PLANTS

SIZING AND DEWATERING SCREENS

Koppers Sizing and Dewatering Screens

Koppers Wedge Wire Screen

Koppers-Rheolaveur Service covers all phases of coal preparation and handling, and offers the convenience and economy of one negotiation, one organization and one responsibility . . . from the original survey to the complete construction and initial operation of the installation.

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Koppers Products for the Mining Field: TREATED TIES, TIMBER, ETC. . . . AR-MOORED TIES . . . COAL CLEANING EQUIPMENT . . . BOILER AND POWER PLANTS . . . FAST'S COUPLINGS . . . FLOTATION OILS . . . PISTON RINGS . . . ROAD MATERIALS . . . ROOFING MATERIALS . . . WATERPROOFING MATERIALS . . . CREOSOTE

use KOPPERS *products*

simple arithmetic shows

PRESSURE-CREOSOTED TIES PAY FOR THEMSELVES

A large Illinois mine had in its main haulage way untreated oak ties which failed from decay in three years on an average. In 1923, 3,000 pressure-creosoted oak ties were installed. After 16 years, these ties are still in track in good condition.

The dollars-and-cents record of those pressure-creosoted ties is shown in this table:

Untreated		*Creosoted*	
Cost tie	$ .38	Cost tie	$ .85
Labor cost installation	.38	Labor cost installation	.38
Cost in track	.76	Cost in track	1.23
5 renewals at $1.06*	5.30	Renewals	none
16-year cost	$6.06	16-year cost	1.23

Money saved by use of pressure-treated ties.....$4.83 per tie
Total saved to date.....$14,490.00

* Labor cost of replacing ties estimated at $.68 each.

What the actual average life of these 3,000 ties will be is not yet known, but, judging from their present condition and the experience of other mines and railroads, the average life should be in excess of 25 years and they will probably remain in service during the life of the mine.

OTHER USES FOR PRESSURE-TREATED TIMBER:

Tipples . . . Pilings . . . Guard Rails . . . Fences . . . Poles . . . Buildings . . . Docks . . . Platforms . . . Flooring . . . Tanks, Sumps . . . Barge Sides and Bottoms . . . Culverts . . . Flumes . . . Trench Lining . . . Conveyor Decking and Supports.

OTHER KOPPERS PRODUCTS FOR THE MINING FIELD: Coal Preparation Plants . . . Coal Tipples . . . Carpenter Centrifugal Driers . . . Boiler and Power Plants . . . Fast's Couplings . . . American Hammered Piston Rings . . . Cylinder Packing . . . Bronze and Iron Castings . . . Flotation Oils . . . Bituminous-base Paints . . . Coal Tar Roofing . . . Waterproofing . . . Tarmac for paving.

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MINING CONGRESS JOURNAL

Vol. 26 APRIL, 1940 No. 4

BY ROYAL COMMAND of KING COAL!

Not the blast of trumpets or the fanfare and splendor of royalty, but the humming sound of moving gears, motors and other mining machinery, together with voices of thousands of coal men greeting each other—this will be the order of the day as King Coal wields his mace in opening the 17th Annual Coal Convention and Exposition of the American Mining Congress in Music Hall, Cincinnati, April 29-May 3.

Turn to pages 43-58 for the final official preview of what awaits you, and decide to be on hand for this NUMBER ONE event on coal mining's annual calendar!

CONTENTS

Page

EDITORIALS
Financing New Mine Development ... 28
The Coal Show Schedule ... 29
Zinc Awaits An Answer ... 29
MAKING EQUIPMENT-MAINTENANCE PAY DIVIDENDS ... 30
By C. C. Ballard and K. F. Humphries
IMPROVING COAL'S COMPETITIVE POSITION THROUGH RESEARCH ... 35
By Clyde E. Williams
BREAKING DOWN COAL AT THE FACE WITH NEW HYDRAULIC MINING PROCESS ... 39
MORE DETAILED DATA NEEDED ON HOIST ROPE SERVICE ... 42
By F. L. Spangler
BY ROYAL COMMAND OF KING COAL ... 43
Official Program ... 49
Exposition ... 51
COAL MINE ILLUMINATION ... 59
By Thomas Allen
KENNECOTT'S RAY MINES EXPERIMENT WITH SHAKER CONVEYOR ... 62
By R. W. Thomas
THE MARCH OF COAL MINING—Ten Years of Progress
The Development of Conveyor Mining ... 64
By G. B. Southward
WITH THE COAL DIVISION OF THE AMERICAN MINING CONGRESS
Tentative Safety Rules ... 66
Special Rules for Mobile Mechanical Loaders ... 67
ON SELECTING A CRUSHER ... 68
By Wilbur Gorman
FINANCING PRIMARY MINING VENTURES ... 69
By Carl J. Trauerman
WHEELS OF GOVERNMENT ... 74
NEWS AND VIEWS ... 78
PERSONALS ... 88
MANUFACTURERS' FORUM ... 92

Opinions expressed by authors within these pages are their own, and do not necessarily represent those of the American Mining Congress

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Julian D. Conover, Secretary

Financing New Mine Development

DURING each business depression of the past there has been a decided turn to the metal mining industry of the West because it was believed to offer a field for investment free from the influences of financial centers and one in which small capital might have a fair chance for large profits.

This tendency was stimulated by the lower cost of drill steel and powder and by the scarcity of employment in usual lines of endeavor.

This stimulated the work of the prospector whose indomitable faith and perseverance laid the foundation for many vast fortunes. During the present depression the very reverse has been manifest, and it may be profitable to study these conditions in the hope that something practical may be developed looking to increased employment as well as to protection of the future against a shortage of minerals.

The development of a prospect calls for non-productive employment of men for long periods and for the use of mining supplies—all without any current return.

If profitable bodies of ore are opened up, if capital can be secured for equipment and construction of plants for the beneficiation of these ores, then these preliminary expenditures may be considered a part of an investment. If ore in paying quantities is not developed, then these expenditures are a total loss.

The metal producing industry is fundamental and essential to the progress of industry. No substitutes for many of its products seem possible. This being true, the development of new sources of metallic and non-metallic products to take the place of supplies now being exhausted is a prime necessity to future industry.

This, of necessity, is a hazardous undertaking, and its risks should be kept at the lowest point possible. It was for this purpose, among others, that the Securities and Exchange Commission was created. Whether wisely or not, it has been functioning for more than five years. It is not proposed to review its work further than to say that much of this time, as in the case of all new governmental agencies, has been necessarily spent in learning the intricacies of the many problems involved in the purposes it seeks to accomplish.

During this period of more than five years, there has been a notable decline in prospecting, a notable decline in the number of new opportunities offered to investors, a notable increase in idle capital in the banks of the country, and, worst of all, a notable increase in suspicion and doubt as to the safety of all mining investments.

The Securities and Exchange Commission undertook "to insure investors the opportunity of exercising judgment based upon a fair disclosure of the facts concerning the enterprise." To accomplish this purpose it required that a registration should be made by every concern seeking new capital, giving a complete and accurate statement of its conditions as a basis for the disposal of its securities. This was an entirely reasonable requirement and one which could have been made by any proposed investor as a condition of his subscription without the intervention of a government agency, and without the enormous proportionate expense required of the applicant to present in Washington the merits of his Nevada property in order to be permitted to offer his stock to a San Francisco investor.

All of these expenses must be paid by the mine and eventually by the investor, and all are an increased burden upon the back of an already struggling industry. This is a criticism of the law and not of the Commission which is doing a fair job in the execution of that law. In the absence of any immediate possibility of repealing the law, there seems but one course to pursue—namely, to aid the Commission so far as possible in its administration of the law to the end that no red tape shall be added to the legal requirements.

A JOURNAL FOR THE ENTIRE MINING INDUSTRY—PUBLISHED BY THE AMERICAN MINING CONGRESS

MINING CONGRESS JOURNAL

Vol. 26 APRIL, 1940 No. 4

Richard J. Lund, Editor

ZINC AWAITS AN ANSWER

SENATE passage of the Reciprocal Foreign Trade Agreements authority and its transmission to the President for signature on April 5 marked the conclusion of the barrage of protests against the State Department treatment of the trade treaty program. As finally sent to the President the resolution was not amended in any way, and so for three years more the Congress has surrendered to the executive branch of the government the power to reduce and fix the import duties on the products of foreign industry and thus to jeopardize wages which now permit of an American standard of living. A pointed example is the reduction from 21c to 10½c per barrel on petroleum in the Venezuelan treaty of last fall. This oil, used chiefly for fuel, displaces American-mined coal, 70 percent of the cost of which is labor.

That some of the protests made before Committees of Congress were not without avail, however, came out clearly in the Senate debate on April 4, when Senators Lee of Oklahoma, Harrison of Mississippi, Clark of Missouri, and McCarran of Nevada spoke pointedly on the experience of zinc producers with the State Department under the Canadian Foreign Trade Agreement which cut the duty on zinc metal $7.00 per ton.

At the Finance Committee hearings on March 1, mining witnesses had clearly and fully presented the mistreatment of the zinc industry; and Senator Josh Lee, on the afternoon of April 4, told the Senate body that although he and other Senators had received assurances from the State Department that no reduction in the zinc duty would be made in the Canadian agreement without letting them know in advance, those assurances had been ignored by the State Department when the treaty was announced. Senator Lee then reminded Senate Finance Committee Chairman Pat Harrison of his statement on zinc during the hearings on March 1 (see page 27 of MINING CONGRESS JOURNAL for March), whereupon Senator Harrison replied:

Mr. Harrison: Mr. President, I may say to the Senator that as a member of the committee I feel that those interested in zinc presented the strongest case of any presented to us. I felt so strongly about the matter that I called up the Secretary of State, and he told me that he had asked the Tariff Commission to make another investigation. I do not think there is any doubt that the situation which has resulted from the increased importation of zinc from Mexico will be cured.

Mr. Lee: I thank the Senator for that statement.

Senate rejection of the Pittman amendment to compel Senate ratification of foreign trade agreements, by the close vote of 44-41, was a blow to the producers of natural resources. Yet the evident sincerity of members of the Finance Committee and other Senators in their desire to see that the State Department deals fairly with zinc by restoring the duty cut made in the Canadian Foreign Trade Agreement, is encouraging and of real significance. It is to be hoped that definite action by the State Department will ensue shortly.

THE COAL SHOW SCHEDULE

WITHIN recent months, the question of the frequency of the Mining Congress' Coal Conventions and Expositions has been raised in certain quarters. This is not an entirely new question. It came up two years ago and was settled so definitely at that time that one wonders why it should again be agitated.

Upon what should the schedule of such a meeting be predicated? There is definite need for an annual Convention and Exposition in the coal mining industry, and coal operators have consistently voiced strong approval of continuing the present arrangements. Evidence of this wholehearted support is expressed in a recent letter from R. L. Ireland, Jr., President, Hanna Coal Company, and Chairman of the Mining Congress' Coal Division, to coal operators urging attendance at the forthcoming Coal Show, which states:

"On several occasions the Coal Division of the American Mining Congress has been asked by some of the manufacturers to consider making the Cincinnati Coal Show a biennial instead of a yearly affair. Each time the Coal Division has considered the subject carefully, and has found an almost unanimous insistence that the Show be an annual affair because of the benefits which accrue therefrom to the operating organizations and to all those interested in coal's welfare."

The support of the industry is directly reflected by the attendance, and it is interesting to note that there is a 60 percent turnover in the attendance of mining men at Cincinnati from year to year. This results largely from the rotation necessary in companies sending their officials and key operating men.

That Coal Show exhibitors get real benefits from their participation is shown by the fact that more than 85 percent are repeat customers. Exhibit advertising is a most important factor in modern selling, and manufacturers generally realize the value of the direct contacts and demonstrations which are only possible at trade shows. The majority also know that the turnover and varying interests of those attending the Coal Show refute the argument that "there aren't enough new developments." Exhibit advertising, like any other medium of advertising, should stress performance and dependability, with things new featured as they develop.

The industry's evaluation of the Coal Show was aptly expressed by Harry M. Moses, President, H. C. Frick Coke Company, and Chairman of the 1940 Program Committee, in the April issue of *Coal Age*, when he said:

"For 16 years the annual Coal Conventions and Expositions of the American Mining Congress have 'sparked' progress in the art of mining coal, with the result that modernization of equipment and methods is forging resolutely ahead and coal is maintaining its position as the nation's leading energy source. The momentum of this progress is all-important and can best be maintained through the industry's concerted support of these annual meetings. . . . Past experience has proved the tremendous influence which these gatherings exert toward improved operating conditions and practices, and their effect on the general welfare of the coal industry."

Performance has earned the Coal Show's esteemed position. The ascending order of these annual meetings is ample proof of the part they play in the coal's progress. Plans for the 1941 Coal Show are already well under way, and everyone with the welfare of the industry at heart will give full support to this key factor in the modernization program.

Making EQUIPMENT-MAINTENANCE Pay Dividends

● ***Careful Attention to Numerous Simple Points, Frequently Overlooked Because of Their Simplicity, Is Key to Efficient Maintenance at the New River Company's Operations.***

By C. C. BALLARD,
Master Mechanic,
The New River Company
and
K. F. HUMPHRIES,
Chief Electrician,
The New River Company

MAINTENANCE of equipment for the coal mining industry embraces such a broad range of work and practices that only the high spots can be touched in an article of this nature. It will, therefore, be our aim to outline some simple points, doubtless familiar to all, but very often overlooked because of their very simplicity.

Mining machinery is built as strong and simple as it is possible to make it; but, being not entirely fool proof, it requires a reasonable amount of care in maintenance and operation. As one of our leaders in the industrial world has said, "Our success depends on the men we keep around us"—and this is truly the major factor in mine operation.

Adequate Records Found Indispensable

To keep in touch with the cost, the life we are getting out of material, and the efficiency out of the operation of the equipment, it was found necessary to keep a record of all equipment. The system described here was set up 12 years ago, and has since proved very helpful, as we are able to check back over a period of time and find the life and work done by cables, armatures, resistances, bearings and many other parts. Also, by this record we are able to check the performance of the operator.

Forms 200 and 300, shown herewith, present the data of a locomotive and a mining machine, which are self explanatory. The figures shown on the forms are not actual expenditures, and are shown merely to demonstrate the method of charging the different items out. It will be noted that this record can be checked back for several years for the data on any part, such as cables, armatures, fields, gears, axles and bearings. A careful study of the forms will bring out several points, such as grade of material; lubrication, as to grade and method of application; and the care the equipment is getting. This form presents to the management a picture of what each piece of equipment is doing as to cost, together with the reason if the cost is out of line.

Form 100 shows a record of one armature, the dates it was in the shop for repairs, the work done, and the material used. As all armatures carry a serial number and all ball bearings are dated, this gives us a check on the grade of material, the lubrication used, the life of the winding (this can be checked back to find the amount of work done in service), the kind of material used, and by whom the work was done.

At the motor pits or motor barns accurate records are kept of the periodic greasing of the locomotives, as well as other maintenance items. Each day the electrician makes up a report of the material used and time ex-

LOCOMOTIVE HA-560 MINING MACHINE
MANUFACTURER SERIAL NO. 3643 6 Ton MINE

DATE REPAIRED	CAUSE OF TROUBLE	NAME OF OPERATOR	WORK TIME LOST	LABOR REPAIR COST	MATERIAL USED: NO. PARTS	SERIAL NO. PART	NAME OF PART	COST PART	TOTAL COST PART
1940									
Jan 3	Loose Gear on axle	F. Hurt		10 00	2	Axle	Trucked Machine Shop Job 321		69 70
7	Overhauling	"		25 00					
9	Broken Axle	"		1 50	1		Trolley Pole		29
14	General wear	"		2 00	6	3350	Fingers		1 26
	Controller								
16	General wear	"		4 00	4	53322	Axle Linings	23 12	
					4	35915	Journal "	11 57	
					6	43539	Arc Deflectors	1 56	36 56
									38 11
							Shop		69 70
				42 50					107 81
Feb 8	General wear. Resistance.	A. Smith		6 00	2	Stacks	Resistance Machine Shop Job 465		45 30
10	Inspection. Loading Pole	"		3 00	1		Trolley Pole		29
21	Wind Switch with power on	"		3 50					
25	Wrecked Bearlessness	"		7 50	4	49535	Spind Box Bottoms	6 40	
					1	108074	Intermediate Gear	3 60	
					1	108075	" Pinion	3 35	
					1	108063	Bushing	1 25	14 46
									14 95
							Shop		45 30
				20 00					60 25
Mar 5	Grounded coil	H. Harris		7 50	1	321	Armature Machine Shop Job 329		105 00
10	Repair Rest	"		2 25	1	#1-46	Rest Switch		9 13
25	Worn out	"		2 50	1		32 Pole Loco Cable	61 87	
					3		Brake Shoes	3 30	65 17
									74 30
							Shop		105 00
				122 5					179 30

Type of data on mine locomotive maintenance shown on company's Form 200

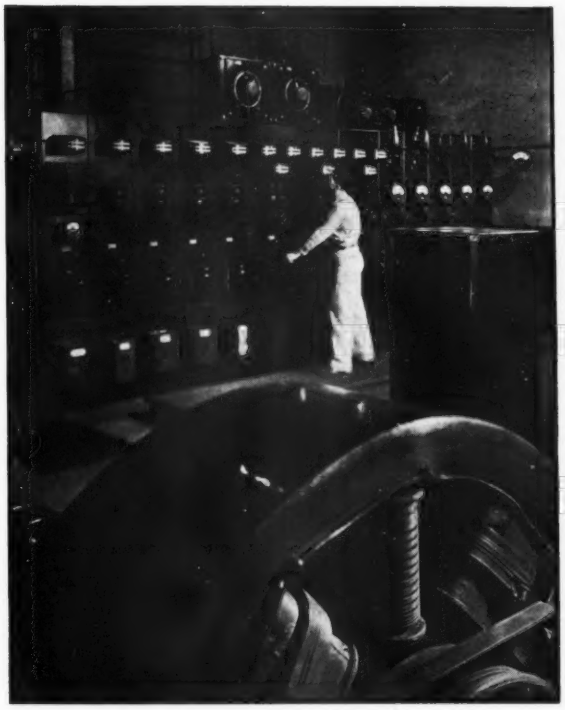
pended, listing the motor or machine number. A copy of this form is here shown. This record furnishes the information of the Forms 200 and 300 which are kept at the central warehouse.

Maintenance procedure on the outside may be roughly divided into three headings:

1. Power distribution and conversion equipment.
2. Coal handling equipment through the tipple.
3. Servicing inside equipment.

Power Distribution and Conversion Equipment

Under this heading is included the power house with its equipment, consisting of the various feeders supplying the fans, pumps (ac) & tipple, town lights, hoist and conversion equipment. Each of these services being metered, a close check can be kept on the efficiency of the various circuits, and an analysis made of any undue fluctuation in consumption. It is also possible to compare several mines' performances when brought to a "cost per ton" basis, and corrective measures applied. These meters are all read daily and a record kept for possible variations. Monthly, a complete reading is taken, including demand, total kilowatt hours, and feeder totals. These figures are assembled for all the mines, and kilowatt hours per ton for each of the services arrived at. This monthly power analysis also includes line loss, load factor, tonnage, demand, and kilowatt hours per ton produced.



Power houses and substations are kept immaculately clean, well lighted and thoroughly painted

As a record of maintenance performed, the accompanying Form 400 is completed by the power house engineer on the first of each month. As will be observed, it necessitates the opening of all control and power transformers, the lowering of the circuit breaker tanks, and starting switches. This keeps the condition of the contacts and oil before the operator at 30-day intervals. It is necessary to operate all safety devices before this form is completed. As a rule, these items are too frequently depended upon without having checked at regular intervals their ability to operate.

Every week a one-hour interruption is taken on the power for the purpose of cleaning up the buses, insulators and switchboard. At the same time the fans and fan equipment are wiped down. All operating linkages for circuit breakers are checked for sluggish operation. These are carefully cleaned and oiled, for it has been found that mechanical trouble has precipitated severe electrical failure due to faulty bell crank action, relays sticking, and circuit breakers failing to operate quickly through mechanical friction.

The transformer oil in the starting switches is completely renewed at yearly intervals. This may seem to be short life for the oil, but the loss of one switch and the attendant loss of production will pay many times over for the small amount of oil necessitated.

The inspection of the other insulating oils will show in the reports before any definite sludging takes place, and new oil may be installed.

The rotating equipment is carefully watched for evidence of vibration, and each three months both the motor and the generator air gap clearances are measured and recorded for showing evidence of bearing failure. If a machine is subject to hard shorts which the breaker is not fast enough to clear, or if flash-over occurs, it is especially important that bearings and vibration be watched due to blisters being raised on the shaft under the bearing shell through current passage to ground

~~ELECTRIC~~ — MINING MACHINE

MANUFACTURER SERIAL NO. 3872 50HP MINE

DATE REPAIRED	CAUSE OF TROUBLE	NAME OF OPERATOR	WORK TIME LOST	LABOR REPAIR COST	MATERIAL USED NO. PARTS	SERIAL NO. PART	NAME OF PART	COST PART	TOTAL COST PART
1940.									
Jan 3	Ball Bearing burnt in truck	Jones		2 46	1	57998	Ball Bearing	5 20	
					1	402160	Hand Lever	9 25	
					1	402161	Rack	5 90	20 35
8	Sight an Butter Bar	"		4 10	1		Tipping Platform Machine Shop Job "257.		33 36
12	Repair Propelling Chain	"		2 46	1	203752	Propelling Chain		17 28
26	Armature grounded	"		3 50	1	521	Armature Machine Shop Job "240		92 30
									37 63
							Shop		12 56
				12 52					163 29
Feb 6	Cable worn	Anderson		2 56	1		#3 Uform Cable	100 92	
					2	763605	Carbon Brushes	1 25	102 20
12	New Head Cable	"		1 25	1		Head Cable		17 26
15	Worm Gear stripped	"		2 46	1	40689	Worm Gear	17 51	
					1		7/8" 30' Steel Rope	6 72	24 23
					1	Stock	Resistance		
							Machine Shop Job "250		13 50
24	Trash Wheels worn	"		3 25	2	55865	10" Trash Wheels	30 00	
					1	57955	Ball Bearing	5 20	35 20
									175 99
							Shop		13 50
				4 55					192 39
Mar 4	Trans. Gear stripped	Mitchell		3 25	2	56359	Bushings	2 60	
					1	43193	Worm Gear	23 75	
					1	55700	Armature	5 60	35 15
12	Repair Main Frame	"		4 10	1		Main Frame Machine Shop Job "241		62 26
22	Propelling Chain broke	"		4 10	1	63658	86 Link Chain		20 64
									55 79
							Shop		62 26
				11 45					118 05

Form 300 shows type of data kept on mining machine repairs

Voltage 550

Received From	Date	Cause	Job No.	Ball Bearings	Housings	Coils	Shaft	Com.	Shipped To	From
Absecott	4-21-30	Short circuits; Roasted + GROUNDED; Pinion end Bearing Worn out	464	did old C.J.B 4/8 New SKF	old OK C.E. Old OK P.E.	New Armature by Stone	OK OK	Old OK	Greenberry	5-25-31
Greenberry	9-20-31	commutator end bearing broken	1753	4/4 New SKF 4/8 Old SKF 4/4 Old SKF	Old OK C.E. Old OK P.E. Rebuilt Both	old OK	old OK	old OK	Greenberry	9-29-31
Greenberry	1-14-32	Pinion end bearing worn out	1445	4/8 New SKF	ends	old OK	old OK	old OK	Absecott	2-1-32
Absecott	10-13-32	Pinion end bearing worn out End fit in casing	802	4/4 old SKF 4/8 New SKF	Old OK C.E. Old OK P.E.	old OK	old OK	old OK	Absecott	8-1-33
Absecott	1-4-34	Commutator work out; Coils short;	856	4/4 old SKF 4/8 New SKF	Rebuilt key ways + New Keys P.E.	New Armature EVANS	old OK	New	Sprague	1-31-34
Sprague	12-20-34	Pinion end bearing Race, Commutator end Bearing worn out,	1723	4/4 New SKF 4/8 Old SKF	Old OK C.E. Rebuilt bore P.E.	old OK	Old OK	old OK	Sprague	1-6-35
Sprague	7-29-35	improper greasing Coils roasted; Pinion end bearings Worn	1372	4/4 old SKF 4/8 New SKF	Old OK C.E. old OK P.E.	Rewound by Rogers	Built upon P.E.	old OK	Oakwood	8-11-35
Oakwood	10-29-36	in bore, loose on shaft; P.E. Shaft Worn Broken shaft, Dirty Trace, causing Pinion	2697	4/4 old SKF 4/8 old SKF	Rebuilt overall C.E. Rebuilt overall P.E.	old OK	New Pigeon Steel Shop made	old OK	Absecott	11-29-36
Absecott	11-11-36	+ Gear to become jammed with mud Grounded Commutator caused by grease	1131	4/4 old SKF 4/8 New SKF	Old OK C.E. Old OK P.E.	old OK	New Pigeon Steel Shop made	New Neck + Axle Ring + New Sq.	Oakwood	12-23-36
Oakwood	7-28-37	Broken shaft	3691	4/4 old SKF 4/8 old SKF	Old OK C.E. Old OK P.E.	New Armature by Rogers	New Shop made	old OK	Greenbrier	9-2-37
Greenbrier	3-17-38	Coils in slots, down on poles, Broken Shaft Come in in unit take over-hauled	4004	4/4 old SKF 4/8 old SKF	Old OK C.E. Old OK P.E.	old OK	Old OK	old OK	Skelton	3-29-38
Skelton	7-10-39	Armature Very dirty Bearings worn out, Dry + Dirty	2678	4/4 New B.S.C 4/8 New SKF	Old OK C.E. Old OK P.E.	old OK	New shop made	old OK	Sprague	8-11-39
Sprague	1-3-40	Shaft broken Pinion end bearing worn out	2458	4/4 old B.S.C 4/8 New Hoffman	Old OK C.E. Old OK P.E.	old OK	New shop made	old OK	Greenbrier	1-13-40
		Shaft Worn out			C.E.= Commutator end. P.E.= Pinion End					

Record of one armature as kept on company's Form 100. Complete checks on equipment performance are possible from such systematized reporting

from the commutator during flashovers. A method of preventing this condition is to install a grounded current collector which is riding the shaft or shaft coupling.

Commutators are maintained from week to week by means of a fine textured stone. The turning of commutators is discouraged and is not resorted to except in extreme cases. Brushes may be manipulated as to placing on the brush studs, and brush tension setting may be adjusted so that a minimum of ridging of commutators is encountered. Considerable correction can be made on rough commutators by centering brushes of slightly more abrasive characteristics on the high places or ridges. With a correctly spaced and tensioned set of brushes, a commutator should practically never require an abrasive smoothing up. Outside causes, such as shorts, which get to the machine will sometimes raise small blisters on the copper. These should be immediately removed by using a fine stone just as sparingly as possible. The safety devices on the M. G. sets are checked and reported each month, as can be seen on the attached form. This includes over-speed and under-voltage. The overload relays being tied in with the under-voltage relays permits the mechanical parts of the overload relays to be tested for correct operation when the test is made for low voltage protection.

THE NEW RIVER COMPANY

DAILY REPORT OF MATERIAL AND LABOR USED ON LOCOMOTIVES AND MINING MACHINES

Mine _____ Date _____ 19____

LOCOMOTIVES

	Manufacturer	Manufacturer	Manufacturer	Manufacturer
Serial No. Locomotive				
Name of Operator				
Cause of Trouble				
No. of Part				
Name of Part				
Cost of Part				
No. of Part				
Name of Part				
Cost of Part				
Total Cost of Parts				
Labor Cost on Loco				
Total Cost				
Time Lost During Work Hours				

MINING MACHINES

	Manufacturer	Manufacturer	Manufacturer	Manufacturer
Serial No. Machine				
Name of Operator				
Cause of Trouble				
No. of Part				
Name of Part				
Cost of Part				
No. of Part				
Name of Part				
Cost of Part				
Total Cost of Parts				
Labor Cost on Machine				
Total Cost				
Time Lost During Work Hours				

This Report to be Made out and Mailed Daily to General Office, Mount Hope, W. Va.

_____ Electrician _____ Superintendent

Form for daily report of material and labor used on locomotives and mining machines

Hoist controllers and contactors are thoroughly gone over each week-end, and all parts unduly worn are replaced. The rotating set rotors, stators and wiring are given a thin painting with a good grade of air drying insulating varnish at yearly intervals. This keeps a smooth hard surface on the

THE NEW RIVER COMPANY
MONTHLY REPORT OF POWER HOUSE EQUIPMENT

MINE _____ 19__

OIL SWITCHES

	Main	Hoist	Fan Power Hse.	Fan Fan Hse.	Pumps	Lights	Tipple	MG Set No. 1	MG Set No. 2	MG Set No. 3	MG Set No. 4
Oil Now											
Strained											
Color											
Now Contacts											
Roll Cranks Clean & Free											
Oil Added											
REMARKS											

STATION TRANSFORMERS

	Station Lighting	Energ Lighting	Tipple Trans	MG Set No. 1 Starting	MG Set No. 2 Starting	MG Set No. 3 Starting	MG Set No. 4 Starting	
Oil Now								
Oil Level								
Clean and Tight Terminal Boards								

SAFETY TRIPS--HOIST

	Under Voltage Trip	Brake Magnet	Slack Brake	Emergency Switch	Over Wind	Over Speed	Man Landing	REMARKS
Operates								

SAFETY TRIPS--ROTATING EQUIPMENT

	Fan Motor	MG Set No. 1	MG Set No. 2	MG Set No. 3	MG Set No. 4	
Over Speed						
AC Under Voltage						
DC Under Voltage						
Over Heating Bearings-Switches						

I hereby certify that I have made these inspections and operated each of the safety trips listed above and that the hoist brake is applied and the power supply is removed upon the operation of each of these safety trips.

Signed _____ Engineer

This report must be made out by the hoisting engineer or day operator on first Sunday in each month and promptly mailed to the Superintendent Electric Equipment. Make the report out in a clear and intelligent manner.

Form 400—Monthly report of power house equipment

coils which facilitates cleaning during the year. This method of maintenance has enabled any number of motors installed on fans, pumps, hoists and M. G. sets to operate as long as 26 years without an electrical failure. Special care is taken in applying this paint at such frequent intervals so that the paint does not block ventilating ducts and air passages. The varnish, as commercially supplied, is reduced in thickness to about 25 percent of its original consistency to obtain this condition.

The power house must be clean, well lighted and thoroughly painted. A photograph of a typical substation is shown herewith. The psychological reaction of power house employes to such a condition will develop such a spirit that there will be clean and well maintained equipment throughout—no patching of equipment will be tolerated, and the various engineers will compete with one another to keep the floors shined, the windows clean, and the equipment in general in the very best of condition.

Coal Handling Equipment Through the Tipple

In handling tipple equipment we are faced with several difficulties—dust, calcium chloride, spray oil and difficulty to lubricate properly.

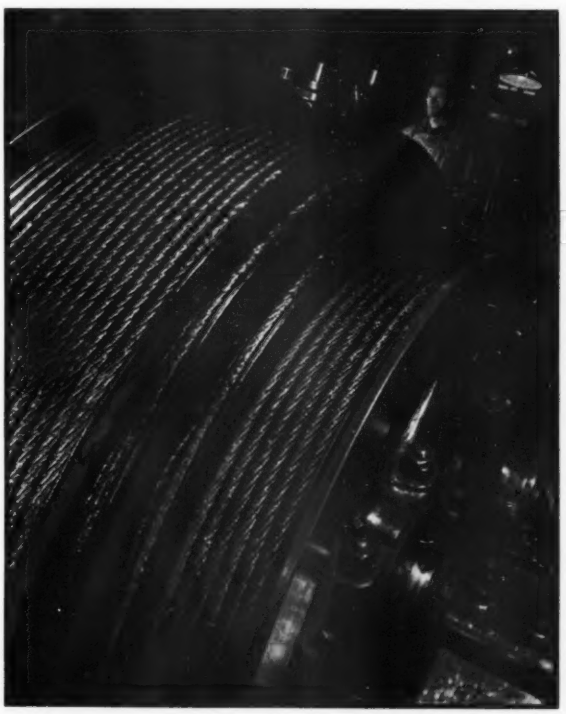
In the case of dust, even with dust collectors and dust allaying sprays, a great deal of material is in suspension in the air. The selection of equipment is extremely important in obtaining good maintenance. Dust-proof electrical controls and totally enclosed motors are of course the most desirable. In the case of drip-proof and open type motors, coverings can be made to fit closely around the shaft and fully protect the motors from splashing. In the regular daily maintenance of the tipple the accumulated dust on all horizontal surfaces should be washed down with a low pressure water hose. This can be done if care is exercised and the hose not directed into the guard openings of the motors. On week-ends the motor starters are opened and blown out with compressed air, the motor guards are removed and the motors blown out, and the oil level in the bearings checked.

At intervals of two months the bearings are drained and new oil installed. This is done by an electrical inspector, and at the same time air gap measurements are taken at the top, bottom and each side of the motor to check for bearing wear. A record of these values is filed for information and reference. At the same time the starters are inspected and corrected for burned tips, faulty overload trips, sluggish operation, and loose connections, and the control push buttons are blown out and inspected.

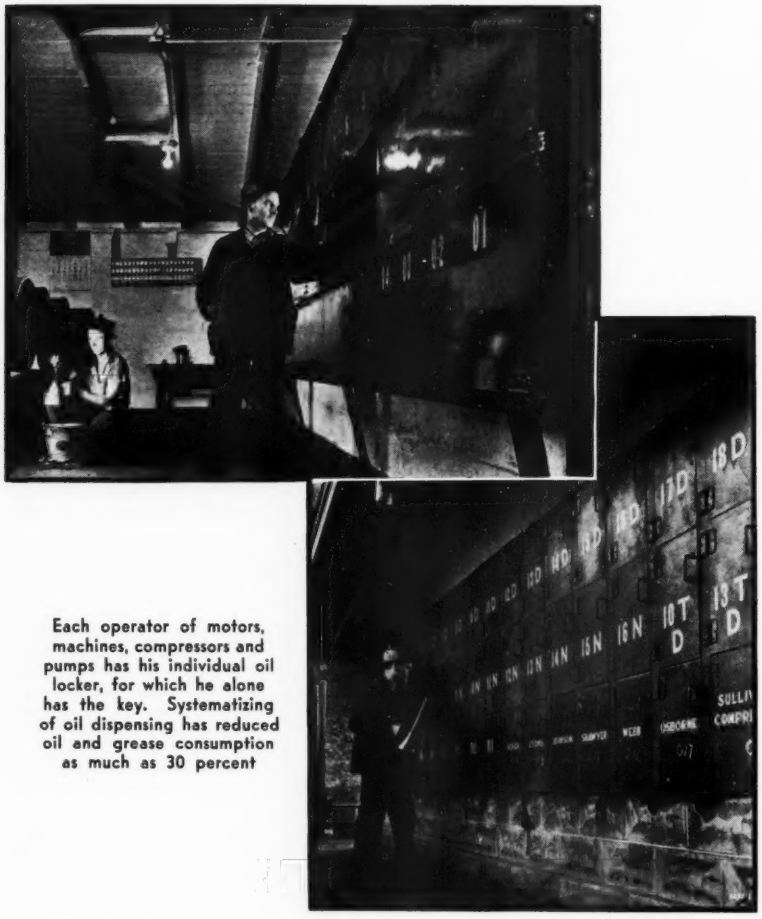
Daily tipple maintenance is accomplished by a competent mechanic who attends to the greasing of chains, conveyors, eccentrics, etc., and makes what minor corrections are possible, reporting any cause which might be responsible for failure to the tipple foreman for correction before the next shift.

A tipple may be made comparatively reliable by the above schedule of maintenance. It is of course necessary to have the motors spray-painted more frequently than if they were not subjected to oil and calcium chloride—a two-year schedule should here be followed. It has been found that much trouble can be prevented if ground lights are installed permamently on the a.c. power bus and observed daily, and any wiring or other ground be immediately corrected. This is also true of the tipple lighting circuits. Periodic tests are made of motor loading, and undue heating is immediately investigated by means of test meters.

Every opportunity is taken to replace old style drives consisting of flat belts on long centers with short center "V-V" or "V-flat" drives. Re-



Best grade of rope grease is applied hot to wire ropes at weekly intervals to get best penetration



Each operator of motors, machines, compressors and pumps has his individual oil locker, for which he alone has the key. Systematizing of oil dispensing has reduced oil and grease consumption as much as 30 percent

markably better results are obtained from short centers, and more safety and less dust is experienced with the removal of flat belts. Better general operating conditions result from such replacement.

The maintenance of wire ropes is an item that is extremely important—the very best grade of rope grease is applied hot at weekly intervals to get maximum penetration. By doing this and replacing sheaves when they are worn we feel that rope life can be greatly increased. Characteristic rope condition is shown in the accompanying photograph.

Servicing Inside Equipment

Under this heading we include the distribution of oils and greases for use on machines, locomotives, pumps, etc. Here there must be an orderly and sure source of supply with the correct grade being issued to each user. In the accompanying photographs of oil houses, it can be seen that each day motor, night motor, machine, compressor and pump operator has his individual locker; he alone has a key for this locker. The cans are filled during the off shift with the proper amount and grade of oil. Access is had from inside the oil house for filling the cans. Each compartment is provided with cotton waste, and the cans are required to be cleaned by the users. The systematizing of oil dispensing has proved that it is possible to reduce oil and grease consumption as much as 30 percent in addition to having the correct grades used for the various services.

Repairs to mine cars should be carefully supervised. Too little attention is often given to the general condition of a car when it is shopped for some minor breakage. When a car is brought to the shop it should be thoroughly inspected—loose plates and supports should be reriveted, and any broken parts replaced so that when the car goes back into service it is in first-class condition. It is surprising to discover the amount of track cleaning that can be saved if the cars are tightened up to prevent spillage. The periodic greasing of cars should be accomplished with the least possible delay. No dependance can be placed in a "catch as catch can" method of greasing. An accurate record of the car number and date greased should be kept for reference.

Arizona's Department of Mineral Resources Aids Mining

A number of mining properties have recently started operating in Arizona as a direct result of the activities of the State Department of Mineral Resources, according to J. S. Coupal, director of the department. "Technical problems have been worked out by the field engineers," he stated, "contacts have been made with capital, assistance has been given in many respects, and the results are now beginning to appear."

"It is most gratifying," Coupal asserted, "to realize that the work of this department has placed properties in operation which would otherwise be idle, thereby bringing new money into the state and creating employment."

Coupal cited the leasing of the Neel placers on the Gila river, 23 miles east of Safford, as one of the most important recent mining developments in which the department was able to make the original contact. The Neel placer property was leased by the General Dredging Corporation and plans are being made for working 120,000,000 yards of gravel.

The third car of ore has been shipped from the Better Pay mine in the Picacho district by Grady Wilson, 2448 North Stone Avenue, Tucson, who used the department facilities in searching for a likely property. It is understood that Grady has recently interested additional capital and plans are being made to sink to the 200-foot level.

These are just examples of some of the results being obtained by the department, Coupal stated. He pointed out that the department has done a great deal along the line of bringing buyers and sellers of mining properties together.

The department recently compiled a list of available mining properties in Arizona and copies have been mailed to interested persons in many parts of the nation. Coupal states that there has been a fine response and that the many requests received for additional information, which the department is able to supply from its files, indicate the interest that is being created in Arizona's mines.

The tendency to form "coke trees" is a problem for some producers of stoker coal. Research at Battelle, however, disclosed that this particular coal, a 1½-in. slack, had satisfactory coking characteristics and was otherwise also suitable fuel for the small underfeed stoker

Improving Coal's Competitive Position Through RESEARCH

● ***If Coal Industry is to Rebuild Itself as an Advancing, Profitable, Powerful Industry, It Must Make Fullest Possible Use of Same Force Its Competitors Employ So Successfully—Research***

By CLYDE E. WILLIAMS
Director
Battelle Memorial Institute

IN COMMON with all industry, the coal industry is run with a view to profits. In common with all industry, also, the coal industry has had in the past 10 years of depression much difficulty in the accomplishment of its aim. But unlike all industry, the coal industry, in the preceding 10 years of general expansion and prosperity, had difficulty in the attainment of profit. A few units of the industry, due to particular conditions, have shown consistently favorable balances, a few more have had only occasional years of loss, but the industry as a whole operated at a profit in only one year of the period from 1924 to 1929, the period of our greatest general prosperity.

Of the several factors that contribute to this condition of profitless operation, rising labor costs, price competition within the industry as a result of excessive productive capacity, and shrinking markets due to the encroachment of competitive fuels, the last is most frequently and most generally blamed. How and why the petroleum and natural gas industries should have been able to contribute to the dethronement of King Coal as shown by the decrease from a peak production of 570 million tons of bituminous coal in 1918 to one of 442 million tons in the relatively good year of 1937 is worthy of serious study by the bituminous coal industry. This is particularly true in view of its competitors' consistently good record of substantial profits and dividends.

Lessons from the Competing Industries

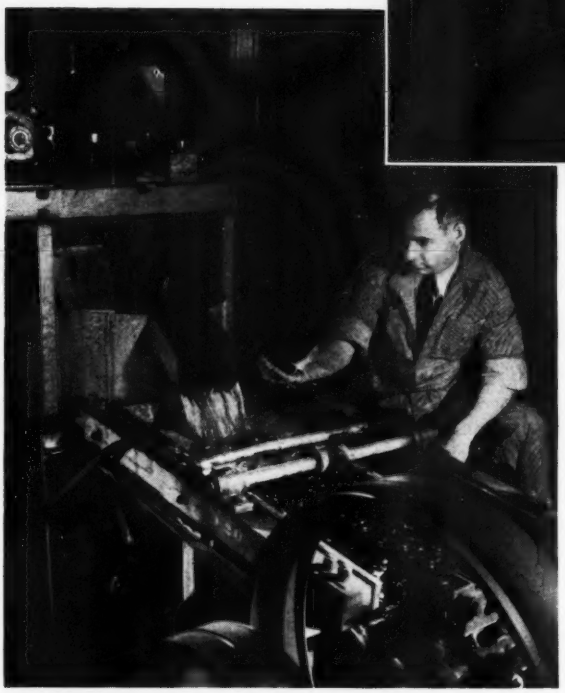
The growth of the petroleum industry is parallel with that of the automobile industry. It would be easy to say that the petroleum industry owed its entire growth to the automobile, but it is equally true that the automobile owes its growth to the petroleum industry. The petroleum refiner not only met the demand for gasoline that he produced from crude oil, but he anticipated the demands; and by research and developments he learned to find new fields, to drill wells to greater and greater depths, to crack and polymerize his products to produce more and more and better and better gasoline that he could sell at no greater and often less cost than theretofore. He took his residual product, fuel oil, and made it into graded products that are substantially uniform in characteristics and performance, whether bought in California or Maine. He encouraged the development of burners for marine, for industrial, for metallurgical and for domestic use, and because of the relative cleanliness and automatic features of the fuel, was able constantly to increase his market at the expense of coal.

Similarly, the natural gas industry found new methods of drilling, developed the long-distance pipe line that takes gas from Texas to the Great Lakes, and with the manufactured gas industry encouraged the development of industrial burners that displaced coal under boilers and in ceramic and metallurgical furnaces, and improved stoves, space heaters, and furnaces that have met with increasingly wide acceptance in both old and new homes.

The keynote in both of these industries has been development and research aimed at three objectives: (1) Lower costs of production, (2) improved products and (3) increased markets. The coal industry has likewise worked toward the first two of these objectives, that is, lower production costs and improvement of prod-

Right—Concentrating tables, jigs, launders, feeders, screens, classifiers and flotation equipment are among the standard and experimental devices crowding the floor of Battelle's main concentration laboratory. Improved concentration methods have bettered coal's competitive position.

Below—Cleaning coal on a small Chance cone



uct, and has made great strides. With the aid of the manufacturers of mining machinery, mechanization of mines has increased at a rapid rate. With cutting machines, loading machines and mechanical conveyors underground, and with continually improved equipment and practices in stripping operations, the production of coal per man-day has steadily increased.

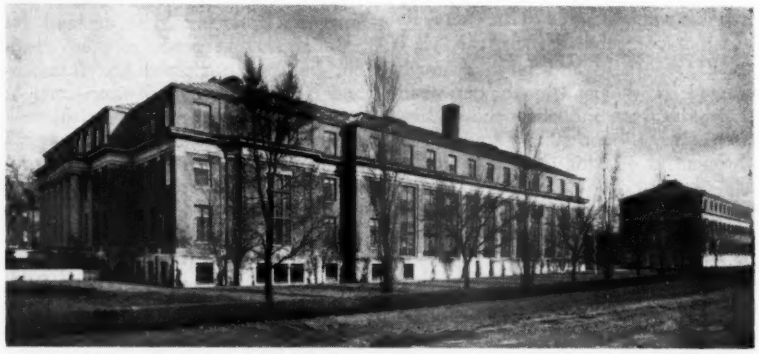
To meet the competition of naturally-occurring coal of lower ash and sulphur content, preparation equipment in the way of launders, jigs, cones and tables has been widely adopted. Research and development, largely by the manufacturers but often in cooperation with the producers, is constantly improving the performance of these machines and the quality of the coal. Together with the equipment for removal of impurities, producers have installed at their tipples elaborate screening equipment to produce any size or range of sizes that the customer demands. Carefully cleaned, closely sized, and dust-proofed, the coal loaded into cars at the modern mine today differs greatly from the run-of-mine product loaded at mines 20 years ago.

Technological Research Needed

Thus it is apparent that the coal industry has moved ahead through research in production and preparation. It is awake to the necessity and value of this type of research, and will undoubtedly go forward with it, steadily and at an increasing rate. In the field of application of the product to present uses and in the development of new markets, however, the coal industry has not kept pace with its competitors and has not yet been fully awakened to the necessity that it do so if it is to prosper.

No one with a full appreciation of the wide variation in types and characteristics of bituminous coal would venture to suggest that coal be made uniform in grades as has been done with fuel oil. However desirable that might appear, the cost of processing coal into products of various uniform grades would take away one of its outstanding advantages, which is that, in most parts of the country, it is the lowest-cost source of heat energy.

The effort must be directed toward greater knowledge of the characteristics of coal and their relation to its performance on various types of equipment, so that the proper coal may be applied to any given use. Millions of tons of coal are today bought on a trial-and-error basis because the manufacturer of the burning equipment,



Battelle Memorial Institute at Columbus, Ohio, houses 175,000 square feet of floor space devoted to research for industry

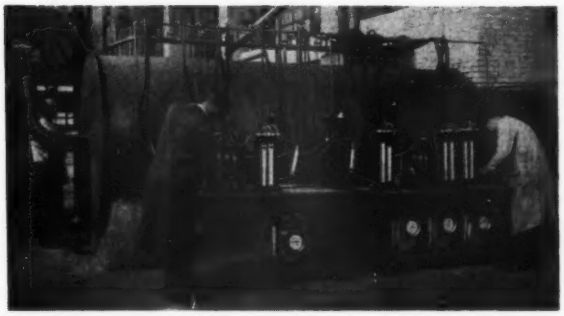
the user of the equipment, and the producer of the coal do not have the assured knowledge required to make the proper selection of the coal.

The Bureau of Mines and the American Society for Testing Materials have led in establishing methods of test for the properties of coal. Users now request and producers can furnish certain values for their coals by the standard tests, but other characteristics such as grindability, friability, ignitibility, caking and coking, clinkering and the effect of size of coal are not yet fully understood. An adequately supported program of research by the coal industry would bring the answers to these problems. The answers would more than pay their cost in the resultant proper application of coals just as the standardization of the grades of fuel oil has paid the petroleum industry.

Improved Equipment for Coal

In the past 20 years the equipment and practices for the use of coal in electric generating stations, in locomotives and in blast furnaces have been so improved as to result in greatly reduced coal requirements per kilowatt-hour, per gross ton-mile of freight or per ton of pig iron. For these advances, the coal industry cannot claim much credit, for they were due principally to the users and the equipment manufacturers. In fact, too many short-sighted coal executives have claimed that these advances have been responsible for much of the decrease in the demand for coal, and for this reason they condemn research as undesirable. The fallaciousness of this reasoning is shown by the fact that the electric power output increased fourfold from 1917 to 1935, an increase that would have been impossible had not the cost decreased through more efficient use of fuels. If the efficiency in the use of coal had not increased, that of oil and gas still would have increased and both they and hydro-electric power would have taken even more of the market from coal than they have.

That other industries have not suffered decreasing markets through increase in the efficiency of their products is shown by the advances made in gasoline mileage and tire mileage on automobiles, both of which have made possible lower cost operation of cars and their use by a greater percentage of the people. The gas industry has not suffered by increasing efforts toward more efficient gas-burning appliances, and that industry has led in the promotion of the advantages of insulation in homes to save fuel.



Fuel research engineers utilize specially designed combustion chamber and auxiliary equipment in the study of burning characteristics of pulverized coals

The coal industry must, therefore, encourage and support the development of equipment and methods for utilization of its products with greater and greater efficiency. In the generation of electricity in the largest power plants, the ultimate in thermal efficiency is now being closely approached, but in thousands of smaller industrial plants coal is being used wastefully. Because of this, and for the sake of lessened smoke, dirt and ash difficulties, many of these plants are turning and will continue to turn to competitive fuels if improved equipment for the use of coal suitable for their plants is not developed.

Residential Heating

The market for domestic coal has long been an attractive one to every producer because the large sizes marketed for stoves and hand-fired boilers and furnaces have commanded the highest prices. The development of the oil burner and the spread of natural gas over the Middle West have made such serious inroads into this profitable market that every operator is keenly aware of the need of the industry for a fully automatic burner to meet the competition. The small underfed stoker has proved a valuable ally to the coal industry, and some 500,000 were installed from 1928 to 1939, with present sales at the rate of 100,000 each year. Without this development, many of these consumers would have been lost to coal with their annual average demand of 10 tons each.

Despite the value of the small stoker to the coal industry, it is recognized that further great improvement in residential coal-burning equipment is required. As a class, these stokers will not satisfactorily burn all types of American coal. Unfortunately, many of the coals that are not suited to the stokers are those that were among the premium hand-fired coals because they did not clinker. To these producers the installation of a stoker means the loss of a customer to the same extent that the installation of an oil or gas burner would have meant. Only one of the many stokers on the market for bituminous coal approaches the completely automatic operation of gas and oil by removing ashes automatically, and its sale is confined to the use of a limited variety of coal.

The predominant market for the small stoker today is in the existing home, whereas the new-home market is going to the completely automatic fuels, gas and oil. Here is an outstanding field where research by the coal industry can obtain information to aid the stoker manufacturer in the development of the completely automatic stoker that will burn a wide variety of coals.

Other New Markets Required

To regain the preeminent position that coal once had as the source of our energy, other markets, long since given up to competitive fuels, or entirely new ones, must be developed. As an example, aside from its use as blast furnace coke, coal has not been widely used in metallurgical operations except for producer gas, and most of this has now been abandoned for oil or gas. The potential use of coal for melting and heating operations in the steel industry represents a market for several million tons of coal. No friend of coal has attempted, by research, to overcome its disadvantage of ash content in order to utilize its advantages of low cost and ready availability in this great industry. Bricks have been fired in isolated instances with coal burned on stokers and in pulverized form, but the coal industry has permitted the ceramic industry to adopt oil and gas to a wide extent through its failure to conduct the research to develop the facts with which the merits of coal could be sold.

Pulverized coal has been successfully used in internal combustion engines in Europe and, although the wear of pistons and cylinders presents a difficult

problem, research continues in Europe, but none is going on in this country on an important scale. Possibilities have been shown of methods for the solution of the difficulties of wear by the use of a water piston in an engine that could have wide application for pumping of water. Here is an entirely new field for coal that can be opened by the power of research.

Research on methods for gasification of coal, particularly those that permit complete gasification without by-products, has been inactive in this country since the advent of the long-distance transmission line for natural gas. But recent developments in England on complete gasification show new possibilities. The coal industry should be active in research to convert its product into the gaseous form which is that most suitable for so many uses.

Much attention has been drawn recently to the possibilities of coal as a chemical raw material for the production of plastics and textiles. Recent estimates have indicated that nearly a half million tons are now used for chemical purposes. These developments deserve the interest and support of the coal industry, although the tonnage markets that it so sorely needs will probably always continue to be in supplying the energy demands of the country.

Bituminous Coal Research, Inc.

After many years in which the markets of the coal industry were slipping away without concerted action on its part to make use of the powerful weapon that it had at its command and which its competitors had adopted, namely, research, the formation in 1933 by a small group of forward-looking executives of Bituminous Coal Research, Inc., as an affiliate of the National Coal Association was a hopeful sign. Having collected sufficient funds by June, 1935, it started a modest program of research which continued through 1938.

At Battelle Memorial Institute, where the principal work was done, the research included a study of the comparative efficiencies and costs of residential heating with various fuels. This gave the first accurate yardstick for comparison of fuel costs to allow a dealer to advise a customer on the choice of his fuel. In an extensive program on the characteristics of coal for small stokers and on the fundamentals of combustion of coal on stokers, information was developed that was of inestimable value to producers and retailers of coal and to manufacturers and dealers of stokers. The publications resulting from the research have become handbooks for coal and stoker men, and the research engineers are in constant demand to address coal and stoker conferences and schools.

With cooperation obtained from two oil refiners and an equipment manufacturer, a two-year program of research on the treatment of coal with oil to allay dust developed the first authoritative information that enabled a producer to choose the type and amount of oil to render his coal satisfactorily dust free. The treatment of coal with oil was thus changed from an uncertain art to a relatively exact science.

In a series of surveys of the use of coal on industrial stokers and in pulverized form, hitherto unavailable information on the characteristics of coal favored by users was obtained. This has proved of great value to coal sales representatives. An experimental investigation of the reactions occurring in stoker fuel beds in cooperation with the Coal Research Laboratory of Carnegie Institute of Technology and the Consolidated Edison Company of New York, Inc., brought a new conception of the process of combustion on these stokers that may bring about great changes in stoker design and improved performance of coal.

An experimental investigation of the segregation of coal in handling in power plants showed that many of the complaints against the producer on non-uniformity of coal are entirely unjustified. An inquiry into the process of hay drying showed the possibilities of a large market for the use of bituminous coal in the drying of hay to produce an improved product. An inquiry into the possibilities of research in the gasification of coal resulted in a publication which was widely acclaimed by the manufactured gas industry. An investigation of the hydrogenation of coal at the Pennsylvania State College developed valuable new information of the possibilities of the production of liquid fuels from American coals.

This first cooperative program of research by the industry not only produced results that were worth many times the amount of $20,000 expended annually for three years, but it stimulated the interest of individual producers and groups in the possibilities of research on their own individual problems. At Battelle and at other institutions, a large number of these individuals projects were carried on.

Despite the general agreement on the value of the program and the wide interest that it aroused, the long-established habit of the coal producer to let the competing fuels have the value of research to themselves had not been broken. When the initial funds that had been collected were exhausted, further funds for immediate continuance of the work were not forthcoming.

A coal sample is being oil-sprayed after which it will be subjected to weathering tests to determine the stamina of the dustproofing agent

Future of Research in Coal

Headed by a group of coal producers with vision, with Howard N. Eavenson, of Pittsburgh, as president of Bituminous Coal Research, Inc., plans for an early resumption of activities are under way. A six-point program of research, including (1) industrial, ceramic and metallurgical uses for coal; (2) automatic comfort heating; (3) complete gasification of coal; (4) coal-burning internal combustion engine; (5) properties of coal ash; and (6) coordination of research, has been formulated by the research program committee. A campaign for funds

from the entire industry by appropriations from individual producers and their associations is under way. Appropriations are on the basis of one-third of a mill per ton of production and active work will commence when a minimum of $40,000 has been subscribed.

Progressive industries today are appropriating large sums of money for research. The chemical industry spends over 3 percent of its net sales income, while industry as a whole spends about 0.3 of 1 percent of its gross income for this activity. Its share of this small average expenditure of 0.3 of 1 percent would mean $2,500,000 for the coal industry in a 400-million-ton year. By comparison, therefore, the minimum goal of $40,000 seems woefully small, but because such worth-while results were obtained with even smaller expenditures, it is enough to make important accomplishments. That there should be difficulty in obtaining it when the need is so great appears absurd.

Leaders of profitable industries today know that industrial progress is built with technological improvements whose keystone is research. If the coal industry is to rebuild itself as an advancing, profitable, powerful industry, or even if it is only to maintain its present place with no further retreat forced by the competition of other fuels, it must make the fullest possible use of the same force which its competitors employ so successfully; it must use research.

Breaking Down Coal at the Face With New HYDRAULIC MINING PROCESS

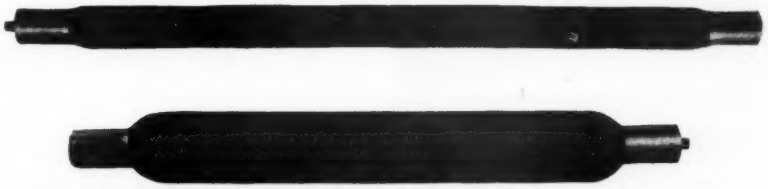
● ***Expansible Tube in Conjunction with High Pressure Fluid Pump Developed to Stage Where Its Use in Breaking Down Coal is Efficient and Practicable. Operations Can Stay at Face During Breaking Cycle***

IT WAS announced early in 1938 that the E. I. Du Pont de Nemours and Co., Inc., Wilmington, Del., had acquired the exclusive rights under United States patent No. 1808162, issued to Samuel G. Frantz, which covers an expansible tube designed to break coal or other materials by hydraulic pressure. Since that time, the Du Pont Company has been carrying on work to incorporate this tube into a Hydraulic Mining Process which would be economically feasible and otherwise attractive to the coal industry. Experimental work has been carried on in Pennsylvania, Ohio, and West Virginia, but the most extensive work has been done at the New Monarch mine of the Consolidated Coal Company at Herrin, Ill. The results obtained in this study to date have been sufficiently promising that the decision has been reached to place the Hydraulic Mining Process on the market in a limited way. Much of the success attained in the program thus far, according to the Du Pont Company, should be attributed to the cooperation of the Consolidated officials and personnel. It should be emphasized, however, that the process is still in the development stage and that further work is necessary in order to work out the details of commercial practice.

The two year program at the Consolidated Coal Company's mine has been devoted chiefly to improvement in the life of the Hydraulic Mining Tubes. During the past ten months, production of coal has been entered into on a semi-commercial basis and the Hydraulic Mining unit at Herrin has broken coal regularly for two Joy No. 5 B U loading machines. The production of these machines has been at least equal to the average of that type of loading machines employed in this mine handling coal shot with permissible explosives.

Basic Features

The Hydraulic Mining Process described herein is basically extremely simple in its features of operation. The equipment comprises an electrically driven hydraulic pump which takes liquid from a storage tank and forces it through a hose into an expansible tube which has previously been placed in a hole drilled into the coal. The resultant increase in diameter of this tube breaks the coal free along its natural parting lines. There is no explosion, no flame, and no evolution of gas or smoke.



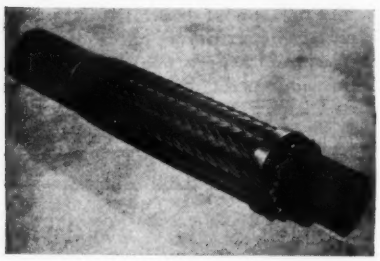
Heart of the process is the hydraulic mining tube. Shown above is a 7-ft. unit in normal and expanded positions

The pump itself, which is of the radial piston design, is not a new development but is one which has been used for many years in connection with hydraulic rams. Its characteristics are such that an automatic change occurs, when necessary, from a high pumping rate with moderate pressure to a slow pumping rate at high pressure and vice versa. It is driven by a 7½-hp. motor, and can be operated up to 2,500 lbs. per sq. in. pressure. A special oil of low inflammability is used as fluid for the system. A series of valves controlling the flow of oil into the tubes is arranged so that one or more tubes can be pumped up at a time, and also so that the oil from one tube may be drained back into the storage tank while another tube is being expanded. The expansible tubes are attached to the pumping unit by means of armored, Neoprene-lined hose.

Self-propelled pump units, both caterpillar and locomotive mounted, have been built for operation in coal seams above 4½ ft. in height. Smaller units intended for lower coal are in process of construction. All of these units are designed so as to fulfill completely the U. S. Bureau of Mines' requirements for permissibility.

Hydraulic Tube Heart of Process

The hydraulic mining tube is the heart of the process. Briefly, it consists of a heavy inside rubber tube covered by an outside envelope of metal braid. At each end, the braid and rubber tube are held firmly together with a metal insert and an outside copper-coated steel sleeve, the latter



Cut-away section of tube, showing composition center

being forced over the assembly of insert, rubber tube, and braid by passage through a die. The insert is tapped at each end so that the high-pressure hose previously mentioned can be attached to either end of the tube.

The outstanding feature of the expansible tube is the design of the braided cover. This cover is so fashioned that, as the tube expands, the cables of the braid reach an angle where they lock and prevent further expansion. This characteristic automatically prevents excessive expansion of the rubber tube and thus guards against accidental rupture. In addition, the restraining outside braid will not allow the rubber tube to expand into crevices in the coal and thus suffer injury through pinching.

Action of Tube

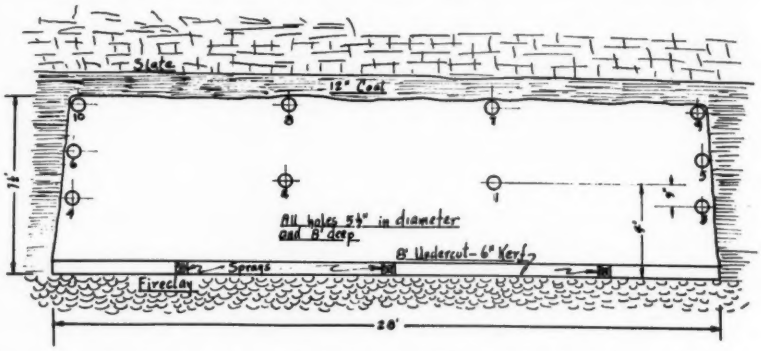
When hydraulic pressure is first applied to a tube in a drill hole, the tube expands, and grips the hole throughout its entire length. As the pressure is increased, the coal at the front of the cut is broken down and the exposed portion of the tube expands until its maximum diameter is reached. The pressure effect is then applied on the coal toward the back of the cut and progressive breaking occurs. As long as any portion of the hole remains intact, and pressure is maintained on the tube, the latter remains anchored firmly in place, and, therefore, cannot fly from the hole. In fact, since the tube must decrease in length as it expands, the front of the tube is pulled back toward the unbroken portion of the hole, giving an observer the impression that the tube is drawing itself into the drill hole. When the hole is completely broken, the tube drops down on top of the loose coal. The pressure is then released and the oil drains back into the storage tank.

When not expanded the outside diameter of the tube is about 4¾ in. The maximum expanded diameter may be varied by changes in braid weave to from 7½ to 11 in., depending upon the type of coal in which the tube is to be used. For commercial operation, hydraulic mining tubes will be furnished normally in lengths of from 3 to 7 ft.

A description of the operating details and the general characteristics of the hydraulic mining process are of interest. It should be mentioned first that the process is not applicable to breaking coal off the "solid." In all of the work thus far, the new method has been employed only with undercut coal. There is good reason to believe, however, that breakage toward a top cut can also be obtained providing the coal is not too high and there is a satisfactory bottom parting. As in the case of permissibles, the cut should be thoroughly "dusted."

Drilling Necessary Holes

After the cutting operation, holes of the proper diameter to accommodate the expansible tubes readily, i.e., 6¼ to 5½ in., are drilled to the depth of the cut, normally at right angles to the face. Experience has shown that the number of holes per working face varies from the same as that required for shooting with permissible explosives, to 25 percent greater than that number. Drilling has been taken care of to date by the more powerful post-mounted electric drills now on the market. Augers are provided with a standard molefoot head on which a pilot head has been welded. Double-ended cutting bits are used in both heads. Two men operate each drill, and a crew provides sufficient holes for coal for one loading machine.



Typical arrangement of holes and breaking order for room in New Monarch mine at Herrin, Ill.

When the drilling operation is complete, the pumping unit is moved to within 15 to 20 ft. of the face, and the coal is then broken down by expanding tubes in the holes in proper rotation. The accompanying sketch shows a typical arrangement of holes and breaking order (Hole No. 1 first, Hole No. 2 second, etc.) for a room in the New Monarch mine at Herrin, Ill. It will be noted that there are 10 holes, 4 in the center and 3 on each rib. Using permissible explosives, 8

holes would be required, one being eliminated on each rib. The bottom row is broken by expanding one tube at a time, since this promotes breakage of the coal into lumps which can be satisfactorily loaded. Small sprags are placed in the undercut to facilitate the breaking. With the top holes, simultaneous expansion of two tubes is preferable, since this gives better spreading action along the roof. A maximum of approximately 2,000 lbs. per sq. in. pressure is used on the tubes, although the front coal frequently begins to break as low as 800 to 1,000 lbs. per sq. in. Essentially all of the breaking is accomplished with 7-ft. long tubes. However, a 4-ft. long tube is occasionally used to square up faces and to roll out bottom coal. From 30 to 45 seconds is required to break a hole after a tube is in position, and a complete room is broken in about 15 to 20 minutes. The average power consumption in breaking three rooms 28 ft. wide and one entry 14 ft. wide was 0.0211 kw. hrs. per ton of coal.

In low coal, and in seams which break more easily than the tough, springy southern Illinois seams, only one row of holes is required, with possibly one or two lower "buster" holes in the wide rooms to assist breakage. Also, in these coals the maximum pressure required is below the 2,000-lb. approximate maximum figure given above.

Operators Stay at Face During Breaking Cycle

The labor involved in the breaking cycle entails inserting the tubes in the drill holes, operating the pump and valves, and occasional inspections of conditions as breaking of the cut progresses. Operators remain near the face. This has been shown to be a safe practice, since the hazards of flying coal, rock, or other materials, and of noxious fumes, which are present with other methods of bringing down coal, have been eliminated. A floodlight is provided on pumping units to light the face and working area; this further enhances the safety of the operation. In the case of pumping units propelled from room to room for use with mobile loaders, a two-man crew is employed. Units which remain in the rooms in conjunction with duckbills and shaker conveyors require but one man, and that man is one of the regular crew engaged in cutting, drilling, and loading as well.

In the operations in which the hydraulic process has been used, there has been no noticeable effect on the roof. Advantage can, of course, be taken of this in many ways.

Top—Inserting tube in No. 1 hole. Tube can be handled readily by one man

Middle—Tube in expanded position has brought down several feet of coal in front, and cracked up back portion of cut

Bottom—Complete cut brought down by hydraulic process. Roof is apparently unaffected by tube's action

Claim Maximum of Coarse, Firm Coal

Mention was made early in this article that in this process the coal merely breaks along its natural cleavage lines. Because of this a maximum of coarse coal results, and this coal is extremely firm. In two screen tests on coal brought down by hydraulic tubes in the Herrin mine the plus 2-in. lump was increased an average of 85 percent as compared to permissible shot coal during the same month.

Mention was also made of the fact that the principal problem involved in the experimental program was the increase in life of the hydraulic tubes. During the course of the development work the DuPont Company estimated that the process would be attractive economically in a respectable number of operations if the average tube life reached approximately 1,500 tons of coal. At the present time in the New Monarch mine at Herrin, tubes are giving an average service of about 2,500 tons before failure. Improvements in performance are being reported regularly. Although this hydraulic process will be offered to the coal industry now, the development program will be continued indefinitely with the expectation that costs will be still further materially decreased.

National Lead Rewards Long-Service Employes

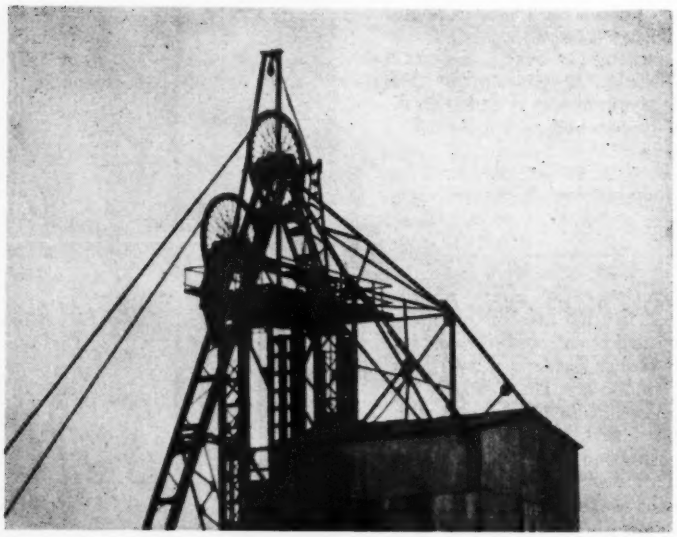
Nearly 400 employes of National Lead Company and its subsidiaries, with service records ranging from 25 to 52 years, received gold watches during the past month as the company inaugurated a new service award program which gives special recognition to those completing a quarter century of employment.

The watches were presented at a series of employe meetings held in a number of the company's offices and plants throughout the country, and were made personally by Fletcher W. Rockwell, president.

The first meeting for the purpose of presenting the watches was held at the company's headquarters in New York City on February 27. The entire staff of the general and sales offices there, numbering more than 350, were in attendance, at which approximately 50 received the watches. This was followed by similar group meetings held at the various plants.

The exact number qualifying for the award up to March 31 is 397. Included among them are factory workers, office employes, salesmen, and members of the executive staff. Nearly every division and plant of the company is represented.

Of the total, 188 employes have service records of from 25 to 30 years; 173 have been with the company from 30 to 40 years; and 33 from 40 to 50 years. Three employes have served 50 years or more.



Correct grooving of sheaves and drums, small fleet angles, proper application of sockets or clips, frequent application of lubricant of proper grade, and gradual pickup and acceleration of load—these are service factors often overlooked which will lead to further wire rope economy

More Detailed Data Needed on Hoist ROPE SERVICE

By F. L. SPANGLER

TO AID in the proper selection and application of hoist ropes, some mines keep life service records of their ropes, so at the time the rope is taken off the total tonnage the rope has given can be determined. Such records allow a comparison between different ropes and between different mines.

However, records of life, in terms of tonnage, are sometimes so erratic that it is difficult to draw definite conclusions regarding the construction and type of rope best suited for the installation. Service conditions are a factor of considerable weight in the determination of rope life, and these vary greatly between different mines.

Even in the same shaft, operating conditions are not always the same and may vary widely, depending on the condition of the equipment, the loads carried, the acceleration, and the smoothness with which the hoist engine is handled. Talking informally on the need for more detailed rope records, an engineer with a large coal producer recently said:

"Many mine companies have gone to preformed rope for hoist cables, since rope of preformed construction has a high resistance to fatigue and is less subject to vibration and whipping, all of which leads to longer service life. There is the danger that because preformed rope gives unusually good service, the user of preformed rope will feel satisfied and will cease all efforts towards improving further his rope performance. As a result, he may overlook certain conditions that he can correct and that will lead to further rope economy. Among these may be mentioned correct grooving of sheaves and drums, small fleet angles, proper application of sockets or clips to the rope, frequent application of a proper grade of lubricant, and gradual pickup and acceleration of the load.

"Many mines have a fair record of rope failures and condemnations, but the record so often lacks some of the information required to form a basis for definite opinion on ropes. Where many different makes of ropes are used, the issue is further confused, since no two ropes, unless on the same hoist, are operating under the same conditions.

"When a rope is condemned or abandoned for further service, we need to know where and why, if we are to correct the faults that are shortening the life and tonnage of hoisting ropes. We need to know, among other things, at what point the rope showed greatest fatigue, causing it to be condemned.

"I believe such records will show that the rise on most step-up drums is too abrupt, causing at this point in the rope a dangerous fatiguing condition. The rise should be designed more on a fillet principle, in my opinion, making the rise less abrupt where it leaves the small diameter and more gradual where it lands on the large diameter. More reliable data on the points where rope failures occur should lead to interesting data affecting drum design. It occurs to me that a moving-picture camera as a check on the cycles of hoist operation would reveal most interesting information. It would show definitely and positively such factors as acceleration, retardation, and speed variation, all of which are essential to good drum design.

"Another place where many rope failures occur is in that section of rope between the sheave wheel and the drum when the cage enters or leaves the dump shoes. This shows that the drop of the cage when leaving the dump, also the stress when entering the dump, creates a severe whip and stress in the rope. There is always a cause for an effect. If we can locate the cause of short rope life we will be in a better position to apply remedies."

BY ROYAL COMMAND of KING COAL !

BE SURE TO ATTEND!

17th ANNUAL COAL CONVENTION AND EXPOSITION

Music Hall, Cincinnati, Ohio

APRIL 29 - May 3, 1940

The American Mining Congress

R. L. IRELAND, JR.
President, The Hanna Coal Company

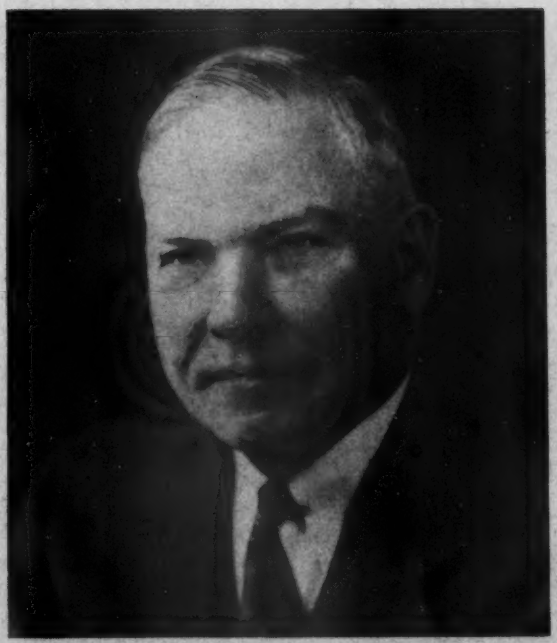
Under Mr. Ireland's capable and enthusiastic direction as Chairman, the Coal Division of the American Mining Congress has pushed ahead to new highs in its contributions to the betterment of coal mining.

HARRY M. MOSES
President, H. C. Frick Coke Company

As National Chairman of the Program Committee for the 1940 Coal Show, Mr. Moses has contributed generously of his time and effort in formulating a series of Convention discussions meriting serious study by the entire industry.

E. M. DOUTHAT
Vice President, Sinclair Coal Company

To plan and effectuate all arrangements for the comfort and pleasure of those attending the Convention—that has been the aim of the Committee on Arrangements, of which Mr. Douthat is General Chairman.



FRANK E. MUELLER
Vice President, Roberts & Schaefer Company

The Manufacturers Division of the American Mining Congress, with Mr. Mueller as Chairman, has again developed another outstanding display of mine equipment and supply items at the Exposition—part and parcel of the Coal Show. His enthusiasm has been an important contribution to its success.

17th COAL CONVENTION

"SEE YOU at the Coal Show"—that's the by-word of responsible mining men in coal districts the country over as final plans are pushed to completion for the 17th Annual Coal Convention and Exposition of The American Mining Congress at Cincinnati, April 29-May 3.

And why? Simply because alert operators know they can't afford to miss these annual assemblages comprising a veritable "Who's Who in Coal Mining"—where a wealth of valuable information gleaned from years of experience is passed out gratis by leading authorities on the Convention floor, with additional timely data coming out in the informal discussions; where progress is keynoted at the Exposition, with literally thousands of modern equipment and supply items brought together under one roof by 150 of the leading manufacturers catering to the country's No. 1 fuel industry; and where plenty of fun during the evening hours is assured by the scintillating entertainment features staged at the Netherland Plaza. That's why!

King Coal truly passes in review at the Coal Show. All important angles to coal's future are analyzed—in the Convention sessions, in talks with manufacturers at the Exposition, and during "off hours." Substantial progress toward an effective solution to the troubles besetting the industry will crystallize from all these discussions. So be on hand early for a front row seat when the curtain opens at Music Hall at 9 a. m. on April 29!

Program Features Vital Operating Subjects

A well-rounded program designed to bring out record-breaking crowds to the Convention sessions has been drafted by a group of 103 prominent operating men (shown on pages 46 and 47) from nine major coal-producing states and areas throughout the nation, under the inspiring leadership of Harry M. Moses, President of the H. C. Frick Coke Co.

The complete program, showing subjects of papers, authors and session chairmen, may be found on page 49, with the details of the special stripping round-table given in the box on page 48.

Perhaps major attention in the modernizing of underground coal-mine operations during recent years has focused on the development of more efficient mechanical loading and conveyor methods. One entire session will be devoted to outstanding problems of mechanical loading and conveying, featuring authoritative discussions on duckbill mechanical loading, mobile machine-loading on conveyors, and multiple conveyor units; and another complete session will be given over to vital phases of operations with mobile loading machines, including two papers on shuttle haulage (one a general review of this development, the other a description of a successful operation recently installed in West Virginia), a paper on track-mounted loading machines, and a discussion of successful pillar recovery using mobile loaders.

No subject has received more consideration in operating a coal mine than proper maintenance of equipment—to be thoroughly reviewed in another session devoted entirely to this subject. One paper will stress the importance of machine maintenance from the production viewpoint, outlining results obtained through the organization of maintenance personnel at a mechanical mine operated on triple shifts; another will emphasize the necessity of accurate cost-keeping in strip operations, and another will show how the cost of repairs made during the shift can be reduced by keeping the equipment in running order through systematic inspection, maintenance and service records.

Subjects of national interest, aside from strictly operating questions, which directly affect the welfare of the coal industry and have considerable bearing on mine operation will be included in another separate session. Scheduled for this will be discussion of the coal industry's problems of sizing, mechanical preparation and loading, stressing the necessity of reducing production cost to meet competing fuels and a resume of measures proposed and enacted by the National Congress, with a clear explanation of how they directly and indirectly affect the production of coal.

Other sessions will be devoted to the equally important subjects of face preparation, applied science in coal mining, surface preparation and safety.

In recognition of the importance of strip mining as an integral part of coal's production, a separate round-table will be held Wednesday afternoon in which all discussion will center on problems peculiar to that branch of the industry. Description of a 35-yard stripping shovel, development of 80-ton haulage trucks, power transmission with armored ground cables, and use of carry-all scrapers in removing overburden are subjects due to be aired.

Arrangements

With E. M. Douthat, vice president of Sinclair Coal Company, as General Chairman of the Committee on Arrangements, no efforts have been spared by all Committee members shown on page 48 to insure smooth functioning of Convention activities during the entire week.

The Attendance Committee has done a fine job in talking up the importance and value of the Convention and Exposition to key operators throughout the country; and the Publicity Committee has worked jointly with them on this, besides turning out effective Convention slogans and working up appealing copy for newspaper stories. An atmosphere of cordial hospitality at the meeting throughout the week will be promoted by the Welcoming Committee, and the Floor Committee will see that proceedings at all the Convention sessions are run off smoothly and according to schedule.

Gadgets to Feature Miners' Exhibit

So popular was this feature at last year's Coal Show, that a bigger and better exhibit of "operating kinks" (devices developed by employes of coal companies) is being planned for display on Convention Floor at the 1940 meeting. The Miners' Exhibit Committee has done a whale of a good job in talking up this event in the field, thereby enlisting interest in submission of entries.

"Cash In" on Your Fun Hours at the King Coal Club

Frivolity and fun galore at the King Coal Club each evening of Convention week, plus excellent "eats" and the "tops" in entertainment at the Annual Banquet—that's what the Entertainment Committee is dishing up this year as an outstanding contribution to the meeting's success. The "Club" will be open for dinner on Monday, Tuesday and Wednesday, with

Program Committee And State Chairmen

ALABAMA

HAROLD McDERMOTT
Chairman
Newcastle Coal Co.

C. S. BLAIR
Black Diamond Coal Mng. Co.

F. E. CASH
U. S. Bureau of Mines

W. C. CHASE
Alabama By-Products Corp.

J. A. DANIELS
Newcastle Coal Co.

J. L. DAVIDSON
Alabama Mining Institute

BEN DAVIS
Sloss-Sheffield Steel & Iron Co.

W. C. HUTCHESON
Wind Rock Coal & Coke Co.

R. E. KIRK
Tennessee Coal, Iron & R.R. Co.

HERBERT S. SALMON
Salmon & Cowin, Inc.

L. A. MICHAEL
Railway Fuel Co.

I. W. ROUZER
Alabama Mining Institute

ILLINOIS

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Chairman
Old Ben Coal Corp.

K. R. BIXBY
Midland Electric Coal Corp.

T. G. GEROW
Truax-Traer Coal Co.

C. T. HAYDEN
Sahara Coal Co.

FRED A. MILLER
Franklin County Coal Corp.

M. F. PELTIER
Peabody Coal Co.

C. J. SANDOE
Perry Coal Co.

L. D. SMITH
Chicago, Wilmington & Franklin Coal Co.

L. A. WASSON
Wasson Coal Co.

WEST CENTRAL

H. H. SPENCER
Chairman
The Pioneer Coal Co.

WM. R. CHEDSEY
Missouri School of Mines

IRA CLEMENS
Commercial Fuel Co.

MERL C. KELCE
Sinclair Coal Co.

E. S. MAYOR
Binkley Mining Co. of Missouri

W. C. SHANK
Crowe Coal Co.

C. Y. THOMAS
Pittsburg & Midway Coal Mng. Co.

OHIO

WHITNEY WARNER, JR.
Chairman
Warner Collieries Co.

S. COTTINGHAM
Hocking Valley Mining Co.

F. R. HANLON
Youghiogheny & Ohio Coal Co.

C. W. JEFFERS
United States Coal Co.

C. G. JOHNSON
Lorain Coal & Dock Co.

FRED A. JORDAN
Youngstown Sheet & Tube Co.

H. J. NELMS
Ohio & Pennsylvania Coal Co.

H. E. NOLD
Ohio State University

A. J. RUFFINI
The Wheeling Township Coal Mining Co.

PENNSYLVANIA

E. A. SIEMON
Chairman
Hillman Coal & Coke Co.

S. W. BLAKSLEE
North American Coal Corp.

C. P. BRINTON
Barnes & Tucker Co.

L. C. CAMPBELL
Koppers Coal Co.

S. M. CASSIDY
Weirton Coal Co.

J. M. CONNOR
Allegheny Pittsburgh Coal Co.

R. M. FLEMING
Ebensburg Coal Co.

G. M. GILLETTE
Northwestern Mng. & Exchange Co.

H. L. GOOD
Westmoreland Coal Co.

K. L. KONNERTH
H. C. Frick Coke Co.

J. B. MORROW
Pittsburgh Coal Co.

GEO. L. SMITH
Rochester & Pittsburgh Coal Co.

KENTUCKY

A. R. MATTHEWS
Chairman
Clover Splint Coal Co.

J. E. BUTLER
Stearns Coal & Lumber Co.

THOS. G. FEAR
Elk Horn Coal Corp.

H. S. HOMAN
Big Sandy-Elkhorn Coal Oprs. Assn.

STERLING S. LANIER, JR.
Norton Coal Co.

HARRY LAVIERS
South-East Coal Co.

H. L. RICHARDSON
West Kentucky Coal Co.

L. C. SKEEN
Eastern Coal Corp.

W. A. VINSON
Hart Coal Co.

choice food moderately priced, pleasant music for dancing, and two stellar floor productions (dinner and supper shows at 8:30 and 10:30 each evening) on Monday and Tuesday. A big double bill Wednesday night will feature a whirlwind card of nine amateur boxing bouts between Golden Glove fighters from coal camps throughout the country, in the Hall of Mirrors at 8 p. m., followed by a flashy floor show in the Pavilion at 11 p. m.

Headlining all four nights of the program will be the top line of Bytonettes—a beautiful group of girls who have won wide acclaim by their exceptional dancing talent. With a wide assortment of novel ensemble routines and specialty numbers, together with a full wardrobe of gorgeous costumes, plenty of variety is assured.

Here are the highlights in outline form:

Monday—"A Night at the Moulin Rouge"—a Parisian show featuring the Slate Brothers, one of the top comedy knockabout trios in today's show business; Chaz Chase, headline star comedian of stage and screen; the Tryon Sisters, beautiful acrobatic dancers doing an Apache turn; Wilfred DuBois, juggler extraordinary; and Diane Denise, captivating songstress doing numbers with a continental turn.

Tuesday—"Can-Can Night"—a continuation of the same atmosphere, but with a completely new production routine introducing Dare and Yates, laugh-a-minute comedy acrobats; Roberts and White, satirical ballroom dancers and humorous pantomime artists; and Doraine and Ellis singing catchy tunes, topped off by special numbers by the Bytonettes in which the audience will participate.

Wednesday—"Fight Night." Full card of nine rip-roaring boxing bouts between Golden Gloves amateurs actually working for coal-mining companies, with six boys from West Virginia, five from Illinois, three from Pennsylvania, two from Kentucky, and one each from Ohio and Colorado. The boys

VIRGINIA

C. F. CONNELLY
Chairman
Kemmerer Gem Coal Co.

J. D. ROGERS
Stonega Coke and Coal Co.
GEO. T. STEVENS
Clinchfield Coal Corp.
SMITH WILLIAMS
Blue Diamond Coal Co.

INDIANA

ROBERT A. TEMPLETON
Chairman
Templeton Coal Co.

DAVID W. ATEN
Maumee Collieries Co.
H. G. CONRAD
Knox Consolidated Coal Corp.
P. L. DONIE
Little Betty Mining Corp.
WESLEY S. HARRIS
Bicknell Coal Co.
JAMES HYSLOP
Walter Bledsoe & Co.
S. H. SCHULL
Binkley Mining Co.

ROCKY MOUNTAIN

FLOYD R. POOL
Chairman
McNeil Coal Corp.

N. C. BROOKS
Northern Colorado Coals, Inc.
C. R. GARRETT
American Smelting & Refining Co.
T. E. JENKINS
National Fuel Co.
C. T. KEIGLEY
Columbia Steel Co.
D. H. PAPE
Sheridan-Wyoming Coal Co.
W. J. SCHENLER
Colorado Fuel & Iron Corp.

TENNESSEE

JOHN W. HOWE
Chairman
Block Coal & Coke Co.

W. B. CROSS
Blue Diamond Coal Co.
HUGH P. FINLEY
The Procter Coal Co.
D. E. GRIFFITH
Pruden Coal & Coke Co.
L. C. GUNTER
Southern Appalachian Coal Oprs. Assn.
T. C. PETERS
Cambria Coal Co.
R. L. WILHELM
New Jellico Coal Co.
E. W. WYNNE
Clinton, Tenn.

WEST VIRGINIA

WM. J. WOLF
Chairman
Consolidation Coal Co.

HAROLD B. DAVIES
Elk River Coal & Lumber Co.
F. K. DAY
Pardee & Curtin Lumber Co.
WILLIAM FINDLAY
Simpson Creek Collieries Co.
C. J. FLIPPEN
N. & W. Rwy., Fuel Dept.
M. H. FORESTER
Consolidation Coal Co.
H. S. GAY, JR.
Gay Coal & Coke Co.
F. F. JORGENSEN
Monongahela Rail & River Coal Corp.
D. L. McELROY
West Virginia University
T. J. McFARLAND
U. S. Coal and Coke Co.
THOS. W. McGUIRE
Carbon Fuel Co.
E. L. MICHIE
Riverton Coal Co.
JOS. PURSGLOVE, JR.
Pursglove Coal Mining Co.
L. T. PUTMAN
Raleigh-Wyoming Mining Co.
JOHN K. SHAW, JR.
Century Coal Co. of West Virginia
H. E. SCHWEINSBERG
Kelly's Creek Colliery Co.
E. J. WEIMER
Koppers Coal Co.
A. S. WILSON
Boone County Coal Corp.

Committees on Arrangements

ATTENDANCE

T. J. THOMAS
Chairman

J. D. FRANCIS
C. A. GARNER
S. B. JOHNSON
F. F. JORGENSEN
EUGENE McAULIFFE
J. B. MORROW
T. C. MULLINS
E. J. NEWBAKER
W. G. POLK
L. T. PUTMAN
ERSKINE RAMSAY
H. L. RICHARDSON
J. D. ROGERS
W. C. SHANK

FLOOR

WESLEY S. HARRIS
Chairman

FRANK E. CASH
WM. R. CHEDSEY
THOS. G. FEAR
C. J. FLIPPEN
E. D. GALL
CARL LEE
H. E. NOLD
ROBT. G. PFAHLER
C. W. SMITH
D. D. WILCOX
E. W. WYNNE

ENTERTAINMENT

JOHN W. HADDOCK
Chairman

H. B. ALLISON
RAY ARMS
DONALD J. BAKER
H. H. BULLEN
J. E. BUTLER
D. J. CARROLL
C. O. CRUMP
C. P. DANIEL
IRVIN DAVIS
R. L. EDGAR
W. T. FERGUSON
GEO. C. HOLTON
SHELLY G. HUGHES
JAMES HYSLOP
G. S. JAXON
C. W. JEFFERS
GEO. H. LOVE
FRED A. MILLER
M. M. MOSER
J. T. RYAN, JR.
B. H. SCHULL
J. J. SELLERS
MERRITT L. SMITH
VAN B. STITH
JOHN T. SYDNOR
C. W. WATERMAN, JR.
FRED A. WILKEY

WELCOME

R. H. MORRIS
Chairman

Special Stripping Round Table

WEDNESDAY AFTERNOON, 2:00 P.M.

Chairman
K. R. BIXBY
Gen. Mgr., Midland Electric Coal Corp., Farmington, Ill.

The 35-yard Stripping Shovel
HOWARD S. RICHARDS
Gen. Mgr., Tecumseh Coal Corp., Boonville, Ind.

Armored Ground Cable for Transmission Lines
O. E. MAY
Chf. Engr.

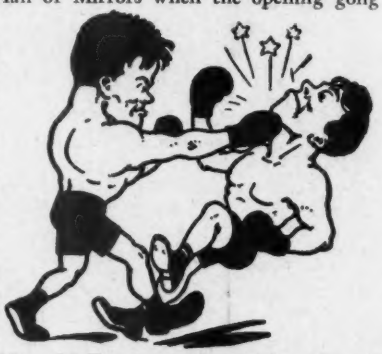
J. C. RETTENMAYER
Chf. Elec., Northern Illinois Coal Corp., Wilmington, Ill.

Carry-All Scrapers as Auxiliary Unit for Overburden Removal
T. G. GEROW
Chf. Elec., Truax-Traer Coal Co., Chicago, Ill.

Development of 80-ton Haulage Trucks
L. RUSSELL KELCE
Vice Pres., Hume-Sinclair Coal Mng. Co., Kansas City, Mo.

\+ + +

are rarin' to go, we are advised, and there's due to be plenty of fireworks in the Hall of Mirrors when the opening gong sounds at 8 p. m. Be on hand to cheer "the winnah" from your district or state!



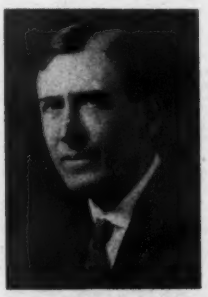
After the boxing bouts there'll be a fast-moving floor show in the Pavillon, featuring the Bytonettes, the Eight White Guards singing stirring songs in their inimitable manner, and Joe and Jane McKenna in side-splitting comedy

PUBLICITY

LOUIS J. OTT
Chairman

BURT B. BREWSTER
JOHN F. COAKLEY
WILLIAM COBB, JR.
JOSEPH G. GREEN
SYDNEY A. HALE
P. F. JASIK
W. EVERETT McLAINE
E. G. MIDDLETON
L. C. MOSLEY
W. W. RODGERS
DR. CLOYD M. SMITH

MINERS EXHIBIT



A. W. HESSE
Chairman

I. N. BAYLESS
K. R. BIXBY
CHARLES P. BRINTON
CLYDE L. BROWN
E. J. CHRISTY
C. C. CONWAY
JOS. L. OSLER
HARRY W. PAYNE
DON B. POTTER
ROY RATLIFF
DAVIS READ
EARL E. RICH
W. N. WETZEL

★PROGRAM★

Meet the Speakers on Page 10

MONDAY, APRIL 29

MORNING SESSION, 10:00 A.M.

Opening Addresses

HARRY M. MOSES
Pres., H. C. Frick Coke Co., *National Chairman, Program Committee*

E. M. DOUTHAT
Vice Pres., Sinclair Coal Co., *General Chairman, Arrangements Committee*

FRANK E. MUELLER
Vice Pres., Roberts & Schaefer Co., *Chairman, Manufacturers Division, American Mining Congress*

R. L. IRELAND, JR.
Pres., Hanna Coal Co., *Chairman, Coal Division, American Mining Congress*

Face Preparation

Session Chairman
ERNEST B. AGEE
Supt., Youngstown Mines Corp.

Coordination of Face Preparation With Mechanical Loading
J. W. ANSTEAD
Elec. Engr., Templeton Coal Co.

Face Preparatory Operations
J. T. PARKER
Mine Supt., Inland Steel Co.

The Floating Shot
JAMES M. GODWIN
Chief Mine Inspector, Pocahontas Land Corp.

AFTERNOON SESSION, 2:00 P.M.

Applied Science

Session Chairman
H. L. RICHARDSON
Vice Pres., West Kentucky Coal Co.

Educational Training in the Coal Industry
H. R. WHEELER
Industrial Relations Mgr., Pittsburgh Coal Co.

Underground Distribution of Power
K. L. KONNERTH
Elec. Engr., H. C. Frick Coke Co.

Roof Support Problems in Long-Life Entries
FRANK G. SMITH
Gen. Supt., Sunday Creek Coal Co.

TUESDAY, APRIL 30

MORNING SESSION, 10:00 A.M.

Surface Preparation

Session Chairman
BYRON M. BIRD
Chief Concentration Engr., Battelle Memorial Institute

Economic Possibilities of Small Coal-Cleaning Units
J. P. HORNE
Gen. Supt., Raven Red Ash Coal Co.

Recovery and Utilization of Refuse From Cleaning Plants
K. A. SPENCER
Vice Pres. and Mgr., Pittsburg & Midway Coal Mining Co.

Modern Coal Cleaning Practice

(a) Appalachian Fields
JOSEPH PURSGLOVE, JR.
Gen. Mgr., Pursglove Coal Mining Co.

(b) Rocky Mountain Field
CARL S. WESTERBERG
Prep. Engr., Utah Fuel Co.

AFTERNOON SESSION, 2:00 P.M.

Mechanical Loading and Conveying

Session Chairman
ROBT. G. PFAHLER
Mng. Engr., The Berwind-White Coal Mining Co.

Duckbill Mechanical Loading
V. D. PICKLESIMER
Gen. Supt., South-East Coal Co.

Mobile Machine-Loading on Conveyors
G. S. JENKINS
Assistant General Manager, Consolidated Coal Co.

Multiple Conveyor Units and Economical Operation
W. J. B. MAYO
Charge of Conveyor Mining, Koppers Coal Co.

WEDNESDAY, MAY 1

MORNING SESSION, 10:00 A.M.

Equipment Maintenance

Session Chairman
P. L. DONIE
Vice Pres., Little Betty Mining Corp.

Organization of Maintenance Crews in Mechanical Loading
CHAS. R. NAILLER
Engineering Assistant to Supt., Hanna Coal Co.

Method of Keeping Detail Cost Records on Stripping Equipment

(a) Stripping Shovels and Coal Loading Shovels
W. W. YOUNGBLOOD
Supt., Midland Electric Coal Corp.

(b) Overburden Drilling and Shooting, Preparation and Haulage
C. W. WOOSLEY
Gen. Supt., Pyramid Coal Corp.

Breakdown Prevention Through Machine Inspection and Service Records
CARR MCCORMACK, JR.
Engineer's Assistant, Newcastle Coal Co.

AFTERNOON SESSION, 2:00 P.M.

Mobile Loading Machines

Session Chairman
C. J. SANDOE
Vice Pres., Perry Coal Co.

Shuttle Haulage for Mechanical Loading

(a) H. B. HUSBAND
Gen. Mgr., Fuel Mine Operations, The Chesapeake & Ohio Railway Co.

(b) HARRY S. GAY
Vice Pres. & Gen. Mgr., Gay Coal & Coke Co.

Track-Mounted Loading Machines
R. L. ADAMS
Gen. Supt., Old Ben Coal Corp.

Successful Pillar Recovery With Mobile Loaders
J. M. CONNOR
Gen. Supt. of Mines, West Penn Power Co.

THURSDAY, MAY 2

MORNING SESSION, 10:00 A.M.

National Economic Problems

Session Chairman
R. E. SNOBERGER
Pres., Binkley Coal Co., Inc.

Doctor or Wet Nurse?
E. C. PAYNE
Cons. Engr., Consolidation Coal Co.

National Legislation Affecting Coal Mining
JULIAN D. CONOVER
Secretary, American Mining Congress

AFTERNOON SESSION, 2:00 P.M.

Safety

Session Chairman
I. N. BAYLESS
General Manager, Union Pacific Coal Co.

Trends in Reducing Hazards in Mechanical Mining
L. E. YOUNG
Cons. Engr., Pittsburgh, Pa.

Accident Sources and Overcoming New Hazards
L. A. HILL
Assistant Supt., Chicago, Wilmington & Franklin Coal Co.

Fixing Responsibility for Mine Accidents
E. W. WYNNE
Compensation Adjuster

Meet The Speakers

(See main program on page 49 and strip box on page 48 for subject and time.)

R. L. ADAMS.—35 years in southern Ill. coal fields as chf. eng. and gen. supt. of Old Ben Coal Corp.

J. W. ANSTEAD.—After preliminary training with electrical manufacturers and power companies has been elect. eng. for Templeton Coal Co. since 1926.

J. M. CONNOR.—After early training in Appal. Field as min. eng., joined West Penn in 1920 as resident eng. and was promoted to gen. supt. of mines in 1934.

JULIAN D. CONOVER.—An engineer of broad experience in various branches of mining in the United States, Alaska and Latin-America. Has followed closely state and national legislation affecting the mining industry for the past 15 years.

HARRY S. GAY.—Pioneer in mechanical mining, having operated mobile loaders successfully for over 15 years in his mines in Logan County, W. Va.

T. G. GEROW.—Engineer in coal strip mining since 1923, with Traux-Traer since 1927 and in charge their strip engineering since 1935.

JAMES M. GODWIN.—Over 30 years as min. eng. and inspector in Pocahontas field. Chief mine inspector for Pocahontas Coal & Coke and Land Corp. since 1922.

L. A. HILL.—Min. eng. for C. W. & F. Coal Company from 1919 to 1937 covering five mines; since 1937 asst. supt. of company's Orient No. 1 mine, where fine safety record has been made.

J. P. HORNE.—Supervising coal mines in Virginia and West Virginia for over 20 years, last six of which as gen. supt. of Raven Red Ash Coal Company.

H. B. HUSBAND.—In West Virginia for about 20 years for Fuel Mines of C. & O. Ry., following early work in Penn. anthracite. Pioneered in use of mobile loaders in W. Va.

G. S. JENKINS.—Engineer and operator in Ill. coal mines about 20 years, during which has pioneered in mechanical loading and in designing new mining methods. Now asst. gen. mgr., Consolidated Coal Co.

L. RUSSELL KELCE.—Recognized as one of leaders in coal strip mining where he has contributed much to developing modern methods for Hume-Sinclair Coal Mining Co. as vice president.

K. L. KONNERTH.—Supervision of elect. engineering for H. C. Frick Coke and associated companies in Penn., W. Va., Ky. and Ill. for past 17 years after early training with mfg. companies.

O. E. MAY.—Chf. eng. for Northern Illinois Coal Corp. past five years following work in machinery manufacture and various earth-moving projects.

CARR McCORMACK, JR.—Several years studying machine maintenance problems for Newcastle Coal Co. in Ala. as eng. asst.

CHAS. R. NAILLER.—Mech. eng. in coal mines for 10 years—with Hanna Coal Company since 1933, and master mechanic at Willow Grove No. 10 mine since 1937.

J. T. PARKER.—After earlier training as eng. in western Penn. coal mines, joined Inland Steel there in 1927; transferred to Wheelwright, Ky., in 1930 as mine supt.

E. C. PAYNE.—With wide experience as mech. and combustion eng. in various industries, has directed sales research for Consolidation Coal Co. since 1927.

V. D. PICKLESIMER.—In eastern Ky. for number of years, recently as gen. mine supt. for South-East Coal Company at Seco, Ky.

JOSEPH PURSGLOVE, JR.—Specialized in construction and operation of coal cleaning plants in Ohio and Penn. past 10 years; now gen. mgr. for Pursglove Coal Mining Co.

J. C. RETTENMAYER.—In elect. dept. of Northern Illinois Coal Corp. past 12 years (now chf. elect.), after earlier work as elect. eng. in manufacture of excavating equipment.

HOWARD S. RICHARDS.—After extensive work in coal strip operation is now gen. mgr. for Tecumseh Coal Corp's. new pit at Boonville, Ind.

FRANK G. SMITH.—Operating in eastern Ohio district number of years, since 1938 as gen. supt. for Sunday Creek Coal Co. Now chairman of A. M. C. Committee making study of roof support problems.

K. A. SPENCER.—Connected with strip mining in West Central field number of years as vice president and manager for Pittsburg & Midway Coal Mining Co.

CARL S. WESTERBERG.—After five years of coal research work for Illinois Geological Survey, has been with Utah Fuel Co. in organizing control laboratory and helping design new Castle Gate prep. plant.

H. R. WHEELER.—Joined Pittsburgh Coal Co. 12 years ago after earlier mining training in W. Va. and Ky., last several years engaged in personnel problems as industrial relations manager.

C. W. WOOSLEY.—With Pyramid Coal Corp. in strip mining since 1926, last seven years as gen. supt. at Pickneyville, Ill.

E. W. WYNNE.—Following many years experience in study of accident prevention, is now compensation adjuster for several coal companies in eastern Tenn.

L. E. YOUNG.—Widely recognized leader in mechanical mining and strong advocate of safety; is now consulting engineer in Pittsburgh, Penn.

W. W. YOUNGBLOOD.—With Midland Electric Coal Corp. for 11 years as chf. eng., and recently as supt., with supervision over development of new properties, plant construction and operation.

\+ \+ \+

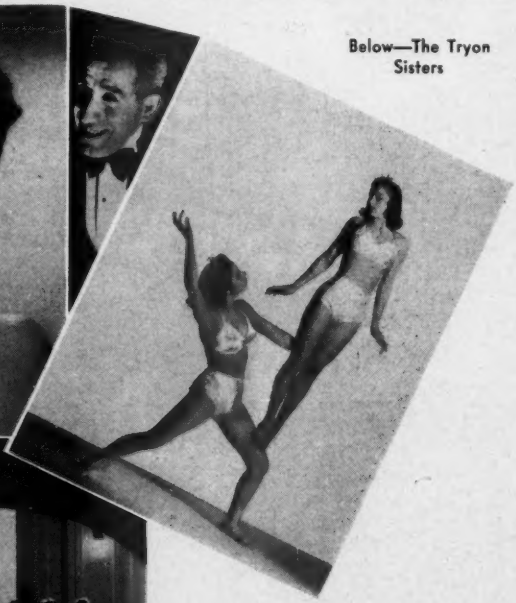
knockabout—with trickster Sid Page officiating.

Thursday—"Annual Banquet." Climaxing the week's festivities, with a dinner par excellence, and entertainment as you like it, headlined by Giovanni—the world's greatest pickpocket, and Sara Ann McCabe—popular and charming songstress of radio and stage, whose fame is skyrocketing; plus Chaz Chase's antics, Eight White Guards' rousing singing, and the Bytonettes in their best numbers—all moving along to Sid Page's charming introductions interspersed with his comedy and magic mimicries. Mayor James G. Stewart, of Cincinnati, will give one of his rousing welcomes, and a short address will be presented by a well-known national figure in public life. Darius A. Thomas, president, Montevallo Coal Mining Company, Birmingham, will preside as Toastmaster.

The visiting ladies will again be royally entertained during Convention week, with a get-together luncheon at the Netherland Plaza on Monday, a bridge luncheon at the Maketewah Country Club on Tuesday, and sightseeing on Wednesday.

Below—Eight White Guards

Below—The Tryon Sisters



Top center (left to right)—Chaz Chase, Sara Ann McCabe and Giovanni—banquet headliners

Left—The Bytonettes will headline all four evenings

Exposition Preview

EXPOSITION

THE opening of the 1940 Coal Show will again find Music Hall at Cincinnati transformed into a "what's what" in coal mine machinery, equipment and supplies. From April 29 to May 3 the three large exposition halls will be filled with coal mining men from all parts of the nation, on their annual idea-gathering visit to coal's show place.

Manufacturers will concentrate their efforts on depicting the modern way in coal mining, placing full emphasis on safety, efficiency and dependability. They'll show things NEW—innovations in wresting coal from beneath the surface and placing it as a premium fuel in the nation's coal bins. They'll show things OLD—the stand-bys that have won their laurels through years of service, with, of course, the improvements and adaptations that have geared them to today's demands.

Coal mining is no longer the operation of years gone by, when coal was "dug" largely by brute strength. The modern mine is almost factory-like in the precision and refinements of its operations. The well ordered routine of today's mine depends on the closest possible coordination of men, equipment and supplies.

The Coal Show provides the industry's annual review of mining technique and practices. Progress drives into obsolescense the equipment and methods of yesterday, and a forward-looking industry has full need for a yearly get-together to maintain its modernization momentum.

Coal Show exhibitors have made careful studies of coal mine operation seeking to learn how their products can best be adapted to the operators' needs. No stone has been left unturned in their search for means and methods of producing coal at a lower cost. Their exhibits will feature their principal developments, and their entire experience is at your disposal through consultation with their specialized personnel.

A. S. KNOIZEN
Incoming Chairman, Manufacturers Division

Several days at the Exposition should be a "must" on every coal mining man's calendar. A careful inspection of all the exhibits at the Coal Show will give a host of valuable ideas that can be put to work on the job back home, and the visit to Cincinnati will give real inspiration for carrying on. Remember that what you get out of the Exposition depends upon how you go about it. Even a superficial inspection will bring some benefits, but if you want to get everything that's in store for you, jump right in and help yourself. Each manufacturer has a real story to tell, or his exhibit wouldn't be there. The exhibitor's representatives are specialized in their particular phase of mining, and they can be most helpful to you in solving some of your difficulties. Be curious! Don't miss a single exhibit! What you don't see, ask for!

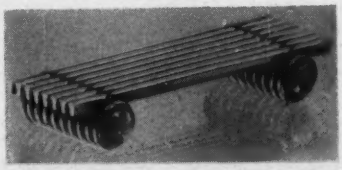
The Manufacturers Division of the American Mining Congress, under the chairmanship of Frank E. Mueller, Vice President, Roberts and Schaefer Company, is sponsoring the Exposition and cooperating fully in all arrangements.

On the following pages you will find a brief preview of what is in store for you at the Exposition. Make a careful note of features of any particular exhibit you'll want to see, and hold plenty of time for features too numerous to be included in this brief outline. It you should wish literature or any special information pertaining to any of the equipment shown at the Exposition same will be gladly furnished upon request to the various companies or to MINING CONGRESS JOURNAL.

DESCRIPTION OF EXHIBITS

• ABBE ENGINEERING CO.

Several completely assembled Abbe-Greening Wedge Wire Slotted Screens of steel, stainless steel, brass and bronze, demonstrating the kind of screens furnished to the coal industry for screening, classifying,



washing, dewatering and removing of slurry from coal. These screens are used in anthracite and bituminous collieries on vibrating screens, coal hoppers, centrifugal dryers, suction filters and other dewatering devices. *In charge—Geo. H. Bussmann.*

• ADVERTISING DISPLAYS, INC. No description received. *In charge—W. P. Cain.*

• AIR REDUCTION SALES CO.

Airco oxygen and acetylene, Airco welding and cutting apparatus and supplies, National carbide and National carbide lights, Wilson electric arc welding machines and electrodes, Stoody hardfacing materials, and specimens of mining machinery parts that have been fabricated or welded by either the oxyacetylene or electric arc welding process. Also specimens of flame hardened pieces of equipment, and of flame cleaned and dehydrated steel. *In charge—J. J. Lincoln, Jr.*

• ALLIS-CHALMERS MFG. CO. No description received.

• ALLIS CO., THE LOUIS

Various types of special electric motors built for use in coal mine operations, including both A.C. and D.C. protected types for both above and below the surface; also company's Bureau of Mines type D.C. explosion-proof motors. *In charge—Van B. Hooper.*

• AMERICAN BRATTICE CLOTH CORP.

Company's new demountable split coupling, which reduces air leakage at the joints to a minimum and permits rapid installation; a short line of Mine Vent tubing, showing the different grades manufactured, and different types of suspension—all connected to a 12 inch diameter blower fan. *In charge—Blaine Mikesell.*

• AMERICAN CAR AND FOUNDRY CO.

New large capacity (10 or more tons), mine car equipped with eight wheels and double knee action swivel trucks and automatic couplers, borrowed for use from one of company's customers for special display purposes. Advantages claimed for this car are: (1) About a 50 percent reduction in dead weight of car per ton of coal transported, (2) very

large capacity, (3) ease with which the car rolls and rounds curves with least possible friction by use of swivel trucks, and (4) flexibility of knee action trucks permits car to stick to the rails. *In charge—L. V. Joyce.*

• AMERICAN CHAIN AND CABLE CO., INC.

Samples of wire rope used in various capacities in coal mine operation.

• AMERICAN CYANAMID AND CHEM. CORP. No description received.

• AMERICAN STEEL AND WIRE CO. See U. S. Steel Corporation.

• ANACONDA WIRE & CABLE CO.

Sunex Securityflex mining machine cable, animated to show various applications to all branches of the coal industry, with an effective story of its development in the southern Andes mountains; and a new type bore hole suspension unit. *In charge—M. J. McCarthey.*

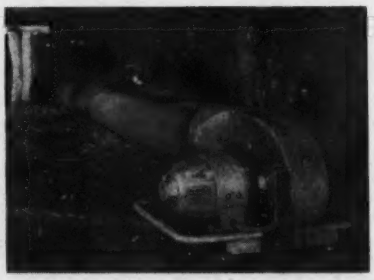
• ATLAS POWDER CO.

Atlas Manasite Blasting Caps and Electric Blasting Caps; and Atlas Coalites, Gelcoalites and Apcols—company's 19 permissible explosives with a wide range of strengths and velocities formulated to meet every blasting problem. *In charge—John L. Romig and J. A. Gilruth.*

• BARBER-GREENE CO. No description received.

• BEMIS BRO. BAG CO.

Installation of company's flexible tubing—Flexipipe—for mine and tunnel ventilation in actual operation by means of a blower fan; sample lengths of Flexipipe showing three methods of suspension; and sewn-in couplings



and detachable couplings attached to display lengths to show ease of coupling the tubing. Especially featured will be company's rope seam suspension and sliding suspension clamp. *In charge—W. H. Evans and D. W. Marshall.*

• BETHLEHEM STEEL CO.

Company's No. 393 turnout with 40-lb. rails, including heel blocks, ties of welded construction, No. 1201 switch stand, and reflector target; No. 1217 switch stand, No. 289 manganese frog, and range of steel ties; Mayari R mine car which has been in service at the Windber, Pa., mine of the Berwind-White Coal Company; two forged steel mine car wheels mounted on a through axle; wire rope, model strander, model closer, and samples of mine rope, stressing preforming and bethanized wire; superior hollow drill steel; and abrasion resisting plates. *In charge—Robert Smith.*

• BIXBY-ZIMMER ENGINEERING CO.

Stainless steel and bronze dewatering screens, and a new development in a special lightweight screen for high speed vibrators. *In charge—Walter H. Zimmer.*

• BOWDIL CO., THE. No description received. *In charge—Charles L. Bowman.*

• BRODERICK & BASCOM ROPE CO.

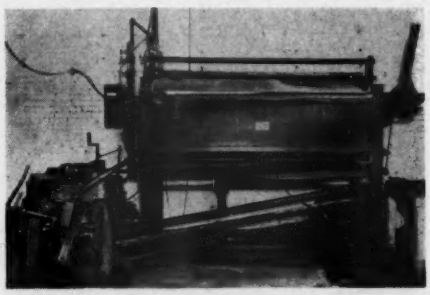
Miniature wire rope machine, consisting of a strander actually fabricating the 19-wire strand of very fine diameter, and a closing machine finishing a complete rope of six strands around a hemp center; the machines, while very small in size and operating at extremely slow speed so that the

details of fabrication can be seen, are duplicates in every respect of actual equipment in the company's plant. Also on display will be samples of company's Yellow Strand wire rope, both Standard construction and Flex-Set Preformed, as well as a number of Yellow Strand Plaited Safety Slings. *In charge—Fred Zimmerman or S. W. Grice.*

• BROWN-FAYRO CO., THE No description received.

• BROWN, INC., L. M.

Company's bit forging machine and furnace, with conveyor and cooling system added since display of the machine at the 1939 show. Company's alloy steel (silicon-molybdenum-vanadium) cutter bits are said to cut more coal per bit point, to reduce the time required for cutting, and to effect a saving of power cost. The company's new super mine bit forging machine



is used to produce Super Cesco Diamond Bits, and is designed to forge these high alloy steels which are too hard to forge by hand or in other types of machines economically. It has a capacity of 420 new bits per hour and can redress 600 bits per hour; both machine and furnace are semi-automatic, and the furnace is equipped with positive automatic temperature control to assure the production of uniform bits. *In charge—L. M. Brown.*

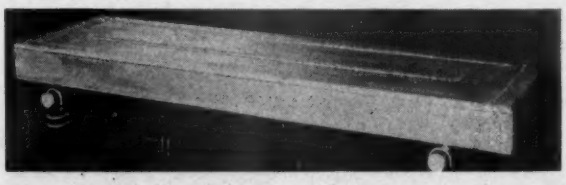
• CALCIUM CHLORIDE ASSN. No description received. *In charge—Robert L. Fosburg.*

• CARDOX CORPORATION. No description received. *In charge—N. Christensen.*

• CARNEGIE-ILLINOIS STEEL CORP. See U. S. Steel Corp.

• CENTRAL ELECTRIC REPAIR CO.

Company's Tramp Iron and Steel Removal Magnet, designed for location in chutes, shaker screens, and the end of loading booms, belt conveyors, etc.,



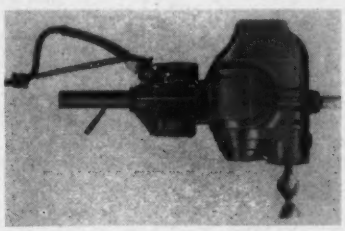
where the product passes in direct contact with the face of the magnet. With three active poles, there is a remote possibility of any iron or steel escaping the magnet. *In charge—E. R. Manley and A. T. Leseur.*

• CENTRIFUGAL AND MECHANICAL INDUSTRIES, INC.

A scene-in-action sign showing a section through the center of company's Elmore continuous centrifugal dryer; several groups of pictures showing preparation plants where these dryers are installed, with results cited; and graphs giving results of the screen analysis of the feed, product and effluent from various operations, with quart samples from the same mines. *In charge—R. A. Bagnell.*

• CHICAGO PNEUMATIC TOOL CO.

Post mounted electric coal drills and mounted hand-held portable coal drills, in both open and permissible types, featuring particularly company's No. 571 Whippet Type of electric coal drill, incorporating the following distinctive features: (1) Built-in adjustable safety clutch which releases when any obstruction is encountered, (2) enclosed auger chuck which eliminates hazard of getting clothing or fingers caught in the machine, and (3) mounting of gearing and clutch at the top of the tool which permits



improved balance. The company also expects to have available for display a model of a self-propelled rubber tired truck mounted coal drill, recently developed, which is equipped with two coal drills operated by two men, permitting the drilling of two holes simultaneously. Also on display will be company's portable electric and pneumatic drills, nutrunners, grinders, chipping hammers, riveting hammers, etc., for repair and maintenance of top and underground equipment and rolling stock, such as mine cars, locomotives, etc. *In charge—L. J. Walker.*

• CINCINNATI MINE MACHINERY CO., THE

Two cutter bar units with cutter chains mounted on a single stand. *In charge—E. P. Stenger or A. O. Bruestle.*

• CITIES SERVICE OIL CO. No description received.

• COAL AGE (McGraw-Hill Publishing Co.)

Repeating publication's "Hall of Fame" with girl artists in costume sketching profiles of all visitors at publication's booth. Additional copies of the April pre-convention number will be available for distribution. *In charge—H. W. Clarke.*

• COAL MINE EQUIPMENT SALES CO. No description received.

• COFFING HOIST CO.

Company's Safety-Pull ratchet lever hoists and load binders, built in capacities ranging from ¾ to 15 tons, with innumerable uses in all types of coal mine construction and maintenance work; the new Power Master gravity lowering chain hoist, built in convertible capacities from one to eight tons; and company's Model C spur gear chain hoist, differential hoists and trolleys. *In charge—Mike Crowder.*

• COLUMBIA STEEL CO. See U. S. Steel Corp.

• DEISTER CONCENTRATOR CO., THE

Latest and most improved items of equipment, including Diagonal-Deck Deister-Overstrom coal washing tables, Leahy No-Blind heavy duty vibrating screens and Concenco spray nozzles. Featured will be the company's new coal washing machine—the Super Duty No. 7 coal washing table—one of which, one-fourth the size of the commercial machine, will be in operation. This table will be powered by the company's new Concenco anti-friction bearing, self-oiling and with fully enclosed head motion.

A commercial size 4 x 7 ft. latest type Leahy motorized screen will also be exhibited and demonstrated, including the Tri-Vibe feature which uniformly distributes the dynamic differential Leahy vibration to the free-swinging screen jacket. Also Concenco spray nozzles in two types—for average and heavy duty washing operation. *In charge—R. T. Bliss.*

• DEISTER MACHINE CO. No description received. *In charge—I. F. Deister.*

• DEMING CO., THE. No description received. *In charge—E. E. Kendall.*

• DIFFERENTIAL STEEL CAR CO.

Reception booth with enlarged photographs of mine haulage equipment, such as high speed mine locomotive, larry cars, large capacity mine cars and haulage systems for surface mining. *In charge—Shelly G. Hughes.*

• DUFF-NORTON MANUFACTURING CO., THE

Twenty-four jacks particularly applicable to coal mine use, including: (1) Adjustable mine timber jack, a tool especially designed for cross-timbering; (2) line of 5-ton automatic lowering jacks, featuring an inset cover, special oil-tempered cadmium-plated springs, and a pistol-grip handle; (3) a mine roof jack, with a variety of tops available for any mine roof requirement; and (4) other types of Duff-Norton jacks, such as the ball bearing screw jack, the 4-way chain jack, journal jacks, trip or track jacks and pinion puller. *In charge—G. C. Hutchinson, Jr.*

• DU PONT DE NEMOURS & CO., INC., E. I. No description received.

• EDISON, INC., THOS. A. No description received.

• ELECTRIC CONTROLLER & MFG. CO., THE

A 1,500-ampere form XLP sectionalizer and a 300-ampere form X sectionalizer, together with a 300-volt oil-immersed across-the-line motor starter for full voltage starting of squirrel cage motors. The sectionalizers are designed primarily for use in coal or ore mines for protecting power circuits, feeding haulage and mechanized mining and gathering systems; each unit uses a line-arc magnetic contactor which scientifically controls

the arc as the circuit is opened, and each is equipped with an easily adjustable overload relay, conveniently calibrated to show ampere rating at which the relay will trip; also included is a timing circuit to provide time delay after the over-load relay has tripped and opened the conductor due to overload ground or short circuit. *In charge—F. C. Winters and C. B. Locke.*

• ELECTRIC RAILWAY EQUIPMENT CO., THE

Standard and special material necessary for complete overhead trolley and feeder installation, including trolley hangers and clamps, section insulators, trolley frogs and standard line of splicing devices. Especially featured will be the company's new Elreco mine type junction box with lid operated switch, the junction box proper consisting of a heavy steel case with hinged lid and steel skids mounted on two sides for convenience in dragging around to different locations in the mine; the action of opening the box lid automatically opens the quick break switch blade, thereby cutting off the current to all parts of the device with the exception of one binding post for the positive connection of the incoming line.

Also on display will be: (1) A new style trolley clamp designed especially for use with large diameter trolley wire, and (2) a new style splicing device utilizing for its holding power the clamping effect exerted on the upper lobe of the trolley wire. *In charge—A. L. Johnston and C. A. Cawood.*

• ELECTRIC RAILWAY IMPROVEMENT CO., THE

Rail bonds of all designs and capacities for mining work, including those recently developed of short length for economy of power and purchase price; also, bonding apparatus, welding equipment and welding rods for bonding purposes. *In charge—N. G. Carlson and P. T. Bevers.*

• ELECTRIC STORAGE BATTERY CO., THE

Interesting cutaway cells showing the interior construction of the various sizes of Exide-Ironclad batteries for storage battery locomotives, illustrating how the active material of the positive plates is retained in tubes of slotted hard rubber—a feature largely responsible for the battery's long life. Cutaway cells will show company's Type MVM, TLM, MEH and FLM batteries—the last being the type used in the largest locomotives. A feature of the exhibit will be a complete Exide-Ironclad battery of the type used on the Joy Shuttle car. *In charge—William VanC. Brandt.*

• ENTERPRISE WHEEL & CAR CORP. No description received. *In charge—W. W. Meyer.*

• FLOOD CITY BRASS & ELECTRIC CO. No description received. *In charge—H. B. Hughes.*

• GENERAL ELECTRIC CO.

Direct current motors and controls for underground mining service, including a G-E Type CY-302, Class BM loading machine motor; a sample a-c gear motor and several dust-tight a-c starters; push button stations; cable samples including bore hole cable, Versatol for tipple wiring, and tellurium power cable for shovels and mining machines; and a resistor arc welder with accessories. Cutaway samples showing construction of mercury arc rectifier tubes, and an alnico magnet rigged to lift 3,000 times its own weight are other interesting features.

• **GIBRALTAR EQUIPMENT & MFG. CO.** No description received. *In charge—D. A. Benner.*

• **GOODMAN MANUFACTURING CO.**

New type 460 track loading machine, showed for first time. It follows the general design of its predecessors—the 260 and 360 types—but is designed for loading coal around the corner of a room neck turned at right angles to the entry, the problem being to clean up the corner on the inside turn; greater swing is provided for the front loading head and the rear conveyor boom.

Novel demonstration of hydraulic control system now available for Goodman track loaders; a type 97-30 troughed belt conveyor, showing

latest improvements in belt conveyor design; a de luxe 512 shortwall; a type 212 low vein (19 inches high), shortwall, furnished with either 35- or 50-H.P. motor, or equipped with a 20-H.P. motor for a conveyor mining machine (shown at the Exposition for the first time); and a shaker conveyor display consisting of a G-20 drive unit operating a line of pans and an A3H duckbill, together with a combination trough support with jacks and other miscellaneous items. *In charge—J. D. James.*

• **GORMAN-RUPP CO., THE.** No description received. *In charge—J. C. Gorman.*

• **GOULD STORAGE BATTERY CORP.**

A complete Gould Kathanode battery type KSHD for shuttle car service, together with the cells and steel tray which make up the complete assembly, with the front of cells cut away to show details of construction. A new development in storage batteries for mine locomotives is the hard rubber monobloc container—display assemblies will include both low and high type cells. Another feature will be an exhibit panel showing various sizes of plates used in the manufacture of Gould batteries, ranging from a huge submarine plate to a tiny plate for a miner's cap lamp battery. *In charge—S. E. Gane.*

• **GULF OIL CORPORATION.** No description received.

• **GUYAN MACHINERY CO.**

A portable arc welder of resistance type, incorporating (1) Rugged construction, (2) thin design, permitting ease of handling in the mine, (3) quick change taps giving a range of 80-200 amperes, and (4) handles that stay cool even while doing continuous welding.

Locomotive, mining machine and slip ring motor resistances, built ruggedly so that the vibration and jars which they encounter in use will not injure them; a choke resistance, built to be permanently connected to D.C. motors, permitting automatic starting after the power has been off and comes back on; and a light weight mine inspection car, powered by a one H.P. geared head motor—the car weighing approximately 530 lbs., with a capacity for carrying four men or the equivalent weight at five or six miles per hour. *In charge—Homer DeJournett.*

• **HENDRICK MANUFACTURING CO.**

A built-up background showing perforated screen plates, dewatering screen plates, grilles and grating, along with various type perforated screen plates with emphasis on stainless steel dewatering screens. *In charge—D. McM. Blackburn.*

• **HERCULES POWDER COMPANY**

An attractive arrangement of flashes which will emphasize the various qualities of Hercules permissibles and blasting supplies for coal mining. *In charge—Theodore Marvin.*

• **ILLINOIS GEOLOGICAL SURVEY DIVISION.** No description received. *In charge—L. C. McCabe and D. J. Carroll.*

• **I-T-E CIRCUIT BREAKER CO.** No description received. *In Charge—Donald J. Baker.*

• **JEFFREY MANUFACTURING CO., THE**

Company's type 29-U universal coal cutter for cutting anywhere in the seam, including shearing; Type L-400 high capacity loading machine; Type

61-CL tire mounted conveyor loader especially designed for conveyor mining; Type 8H Aerodyne mine fan; Types 61-L and Aerodyne midget blowers for conveyor mining; Types A-7 hand-held drill and A-6 post drill; Flextooth crusher; electric vibrating Conveyanscreen; Diaphragm Jig as part of a unit washery for small tonnages; electric vibrating pan feeder; and miscellaneous items such as belt idlers, chains, etc.

Moving pictures showing these various Jeffrey units in actual operation will be shown in the Jeffrey Little Theater adjacent to the company's exhibit.

• **JOHNSON-MARCH CORP., THE.** No description received. *In charge—J. G. Bently.*

• **JOY MANUFACTURING CO.**

Company's 11 BU loader—a high production unit for high seams, with a capacity of eight to ten tons per minute; a 14 BU loader, a high capacity low vein machine only 26 in. high, capable of producing five tons per minute; a 42-in. shuttle car for use in medium and high seams—also furnished in 48-in. height, handling from 4½ to 6 tons, depending upon

height; the 32-in. shuttle car designed for operation in low coal, and also furnished in 38-in. height, with capacities of 3½ to 4½ tons, respectively; and the new Joy drill, affording efficient operation by compact design and lightness, and presenting several distinctly new features that make for low cost operation, speed and safety.

• **KANAWHA MANUFACTURING CO.** No description received.

• **KING POWDER CO., THE.** No description received. *In charge—F. T. Morse.*

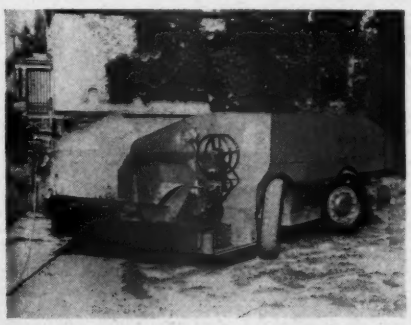
• **KOPPERS COMPANY**

Half of display devoted to Koppers-Rheolaveur Company, and other half to the Wood Preserving Corporation—subsidiaries of The Koppers Company. Translites in panel devoted to Wood Preserving subjects and Rheolaveur subjects, the latter presenting a mechanized effect to the Menzie's cone separator by means of properly synchronized lights. Koppers Ar-Moored ties for mines will also be exhibited.

• **LA-DEL CONVEYOR AND MFG. CO.** No description received.

• **LEE-NORSE CO.**

Introducing a four-wheel drive, four-wheel steer rubber-tired haulage unit ranging in capacity from 2½ tons to 10 tons in both storage battery and cable reel types. Each wheel drive consists of a unit assembly having an electric motor, gearing, supporting spindle and hydraulic brakes. Steering and controls are arranged symmetrically and operate to equal advantage

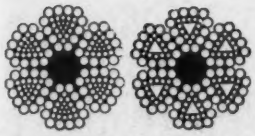


in either direction of travel. A very short turning radius is made possible by the four-wheel steering principle.

An auxiliary piece of equipment is a self-propelled mobile conveyor, mounted on rubber tires and readily movable at desirable intervals in order to shorten the haul distance. This unit is used as the transfer station for unloading the car. *In charge—E. M. Arentzen.*

• **LESCHEN & SONS ROPE CO., A.**

Complete assortment of samples of wire ropes used on all types and kinds of coal mining machines and equipment, including Hercules red strand wire rope in round strand, flattened strand, and non-rotating constructions in both standard and preformed types. Also, a more flexible



type of company's flattened strand Style B, designated Style G—both of which types are planned to be stronger, more compact, and to offer more resistance to wear than rope of the same size and grade in the round strand construction. *In charge—W. C. Richards.*

○ LINK-BELT CO.

Having for its theme "From Mine to Boiler," a large photo mural will depict company's equipment for every phase of coal handling—from mine to coal preparation plant, to power plant, and into the furnace of the boiler. Included are conveyors out of the mine, coal tipple and cleaning equipment, the air-pulsated wash box, crawler shovels and draglines for strip mines, coal and ash-handling equipment at the power plant, and automatic stokers for feeding the coal into the furnace in the home and at industrial plants.

Especially featured will be the Link-Belt Roto-Louvre dryer, and a new Two-Roll Coal Sizer with motor operated mechanism for automatically adjusting the roll centers to the size of coal to be crushed. Also on display will be a Link-Belt P. I. V. gear variable speed transmission.

The company will also feature descriptions of a new coal preparation plant of Utah Fuel Company at Castle Gate, Utah, by means of still pictures, a unique flow sheet, and motion picture film. *In charge—A. H. Boike.*

○ McLAUGHLIN MFG. CO., INC. No description received. *In charge—Norman Sippel.*

● McNALLY-PITTSBURG MFG. CORP., THE

Photographic display of plants constructed by the company. *In charge—C. W. Waterman, Jr.*

● MACWHYTE CO.

Introduction for first time of swaged cable terminals, a permanent end-fastening for mining machine and mining unloader machine swing ropes, and underground slusher machine ropes. Also a complete line of specially designed wire ropes for all types of mining equipment, including ropes up to 2¾ in. diameter for use in shaft mines and strip mines; and special braided wire rope slings, together with an educational picture showing the complete manufacture of wire rope. *In charge—James A. Long and F. J. Nelson.*

● MANCHA STORAGE BATTERY LOCOMOTIVE CO. See Goodman Manufacturing Co.

● MARION STEAM SHOVEL CO., THE

Photographic display of shovels for coal stripping and loading. *In charge—L. C. Mosley.*

● MECHANIZATION, INC.

Copies of latest issue of publication, together with copies of *Mechannual*, a new factual book on coal mine mechanization. *In charge—Ray Coombes.*

● METAL & THERMIT CORPORATION

Thermit welding equipment for eliminating rail joints and rail bonds, and the joining of rails into long, continuous lengths. Although no working demonstrations can be made, all of the equipment required for doing such work will be on display, and set up to simulate an actual welding operation. Finished sample rail welds will be available for examination.

Also shown will be the Murex line of electrodes, which includes rods for all types of electric arc welding, as well as for building up and hard facing. Sample pieces indicating recommended procedures for such work as the welding of new ends to worn dipper teeth will be included. *In charge—Merritt L. Smith.*

○ MINERS' EXHIBIT

Practicable operating "kinks and gadgets" developed by coal men as a means of saving time and effort in a great variety of work in and around the mine and tipple. This exhibit has been assembled under the direction of a committee headed by *A. W. Hesse, of the Buckeye Coal Company.*

○ MINE SAFETY APPLIANCES CO.

New and improved products for safer mining, including: Edison Model "P" electric cap lamp and M. S. A. Comfo Caps; newly designed methane gas instruments to supplement the M. S. A. methane detector; back-type one-hour oxygen breathing apparatus; single-filter Dustfoe and

Comfo dust respirators; gas masks with new all-vision facepieces; a special hand lamp; Foille spray kit for treating burns; Velocity Power rail punch and Velocity Power cable splicer for trailing cables, etc.—explosively-actuated portable tools using blank cartridges as the source of energy; and the Rheoderm apparatus for treating athlete's foot.

Also on display will be company's complete line of standard equipment, including self-rescuers, portable and semi-portable rock dust distributors, trolley wire guards, bakelite explosives carrier, midget impinger for sampling dusts, first aid materials, eye protection, safety clothing, and the H-H inhalator. *In charge—M. L. Moll.*

● MINING CONGRESS JOURNAL

Copies of pre-convention issue, featuring the official preview of the entire Convention, together with thumbnail descriptions of most of the equipment to be on display at the Exposition. *In charge—Richard J. Lund.*

● MORROW MFG. CO., THE. No description received. *In charge—F. R. Morrow.*

● MYERS-WHALEY CO.

Company's No. 3 L. S. Whaley Automat coal loading machine in operation, together with photographs illustrating use of the machines. *In charge—Charles C. Whaley.*

● NA'L CITY BRONZE CO. No description received.

● NATIONAL ELECTRIC COIL CO. No description received. *In charge—Fred W. Kirby.*

● NATIONAL MALLEABLE AND STEEL CASTINGS CO.

Naco cast steel mine car wheels, mine car hitchings, mine car friction draft gears, Willison automatic couplers of cast steel, and combination coupler and draft gear with cast steel draft gear housing. *In charge—L. L. McKee.*

● NATIONAL TUBE CO. See U. S. Steel Corp.

● NORDBERG MANUFACTURING CO.

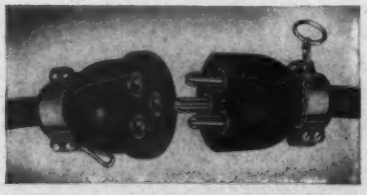
A 3 x 10-ft. double-deck Symons screen in operation, with the drive now located at the feed end instead of the discharge end, as has been the standard

design of this screen. The drive may now be had either at the feed or discharge end, whichever is preferred. *In charge—Delbert Kay.*

● OHIO BRASS CO.

A comprehensive line of control and connection equipment especially designed for the needs of mechanized mining. Utilized in the display will be a huge blueprint map of typical underground room and entry work showing control and connection equipment in their various applications, and illuminated illustrations of the various devices at the side of the map, keyed in with small indicator lights on the map, so that illustration and indicator lights flash on simultaneously.

Also included will be a new rubber cable junction plug, the new ADG



explosion-proof motor starter, the Type B interlocking multiple junction box, and O-B's wedge bond in which the tremendous pressure created by the wedge action ("cold-welding" this bond to the steel rail) will be illustrated by means of an actual test set-up which will allow convention visitors to apply the bond themselves. *In charge—J. C. Wilson.*

○ OHIO CARBON CO., THE. No description received.

○ OSMOSE WOOD PRESERVING CO., OF AMERICA, INC.

A moving picture film illustrating simplicity of application of company's preservative treatment for mine ties and timbers, with actual samples of treated and untreated ties showing advantages of treated materials. Also, cross-section samples of various wood species treated by Osmose, indicating the penetrative qualities of this method of treatment. *In charge—M. B. Morrison.*

• **OWENS-CORNING FIBERGLAS CORP.** No description received.

• **PENN MACHINE CO.**

Complete line of Super-Weld rail bonds, including the Everlast, the TP-9 removable, the minimum length PM-10 joint bond, and U bonds. Featured will be special alloy non-scoring bronze axle liners, journal liners, bushings and bearings (fully machined), together with company's new form Stronger Tooth hardened solid gears and armature pinions for mine locomotives. *In charge—S. Guy Little.*

• **PENNSYLVANIA ELECTRIC COIL CORP.**

Vacuum Bakelized field coils for numerous types of coal cutters and mining locomotives, including a demonstration by practical test showing that company's Class AAAV field coils treated with special high heat-resisting, heat-reacting varnish will stand the hot spot test used for Class BBBV field coils. Included in the armature coil exhibit will be coils in all stages of manufacture. *In charge—Kenneth Green.*

• **PHILCO CORP., STORAGE BATTERY DIVISION**

All types of storage battery for mine haulage service, including the new type AMH, with capacities up to 1,000 ampere hours, two complete permissible battery assemblies for shuttle car service, several of the new molded monobloc assemblies, and cut-away descriptive cells showing the component parts of the battery. *In charge—M. W. Heinritz.*

• **PORTABLE LAMP & EQUIPMENT CO.**

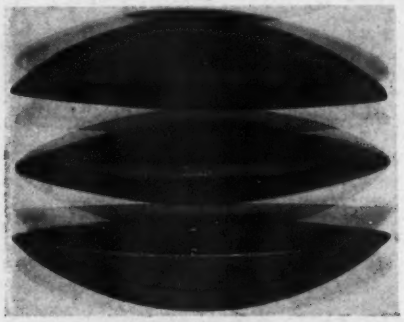
Complete line of personal protective equipment for the coal miner, featuring the new Portable electric cap lamp and Portable's track tackle line of haulage safety devices. The latter consists of new and improved car stops, skids, derailers, transition rails, splicers, and a new switch signal device. Also displayed will be a complete line of goggles, respirators, safety shoes, cool caps and hats, safety belts, permissible blasting units, powder bags, heated first-aid cabinets, stretcher boards, etc. *In charge—George C. Nelms.*

• **POST-GLOVER ELECTRIC CO., THE.** No description received. *In charge—C. E. Nuckels.*

• **PRODUCTIVE EQUIPMENT CORP.** No description received. *In charge—L. H. Lehman.*

• **PROX CO., INC., FRANK**

Full line of invincible chains for regular mine bits and new tool steel-invincible chains for company's factory-made, double-pointed bit made of alloy tool steel and scientifically hardened for mining machine service. The outstanding characteristic of the Prox bit is its circular back edge, being formed as a unit into this shape to afford the greatest obtainable



strength and cutting power per weight of bit. It is claimed to be the quickest and easiest bit to change ever used on a mining machine, setting automatically to exactly uniform gauge throughout the cutter chain. The cutting power of this hardened tool steel point is claimed to be equivalent to that of any type of hard-tipped or faced bit, so that a large number of tons may be cut with very few bits. *In charge—Frank L. Fulke.*

• **PURE OIL CO., THE**

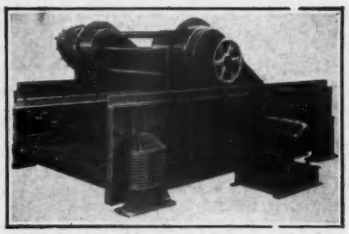
Complete line of lubricants recommended for use in the mining industry, including special products designed to withstand extreme conditions of heat and cold; also displayed will be certain bearings and equipment where maximum results in operation may be obtained through use of the company's mining lubricants and engineering service. *In charge—E. S. Miller.*

• **ROBERTS & SCHAEFER CO.**

Full size Stump Air-Flow coal cleaner, 1940 model, with all the working parts of the unit proper, driven by two motors. Also on display will be a small-scale model of the Raymond heat dryer, showing all working parts, together with a display of photographs, diagrams, and other exhibits of coal-cleaning equipment. *In charge—Raymond G. Lawry, M. E. Haworth, and R. G. Miller.*

• **ROBINS CONVEYING BELT CO.**

New Eliptex screen in operation—a flat screen occupying a minimum of headroom and utilizing a unique elliptical motion which results in extremely accurate sizing of the material and furnishes a feeding action propelling the material horizontally along the screening surface. The entire screen is cushioned on heavy coil springs. A new and simple friction check



device on the Eliptex screen keeps the screen motion under control at the periods of starting and stopping.

Also on display will be six of the company's different kinds of belt conveyor idlers, together with a set of photographs of many of the company's products. *In charge—A. E. Conover.*

• **ROEBLING'S SONS CO., JOHN A.** No description received. *In charge—Fred Maple.*

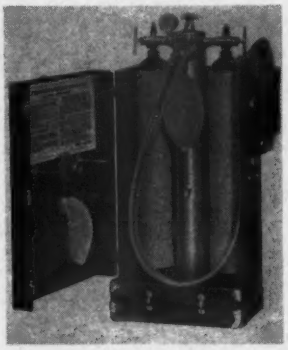
• **ROME CABLE CORP.**

Samples of company's insulated wires and cables, featuring the Rome "60"—a product especially designed for locomotive and mining machine

cable. Extreme adhesion between the insulation and the strand of the locomotive cable is designed to give service under the most severe conditions. *In charge—C. B. Llewellyn.*

• **SAFETY FIRST SUPPLY CO.**

In addition to company's regular items applicable to the mining industry, new items featured include: (1) Resuscitator-inhalator and aspirator for



use in emergency where respiratory failure exists, resulting in asphyxiation; (2) head and eye protectors and respiratory devices; (3) asbestos fireman; (4) aluminum ladders; and (5) shot-firing reels. *In charge—L. J. Biggs.*

• **SANFORD-DAY IRON WORKS, INC.** No description received.

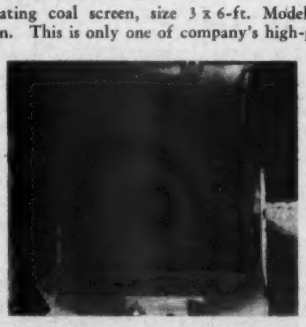
• **SHELL OIL CO., INC.** No description received.

• **SIMPLEX WIRE & CABLE CO.**

New markings to be found on all stock sizes of Tirex cords and cables, showing in raised type the number, size, and stranding of the conductors, the type of the cable, and its voltage rating. These markings are said to comprise a notable advance in the art of cord or cable construction from a safety viewpoint. Also on display will be company's complete line of non-metallic cables for power distribution and telephone service. *In charge—E. J. MacKenzie.*

• **SIMPLICITY ENGINEERING CO.**

Simplicity Gyrating coal screen, size 3 x 6-ft. Model "C" single-deck screen, in operation. This is only one of company's high-production screen-



ing units available in sizes from 2 x 3 ft. up to 5 x 12 ft., built in single-, double-, triple-, and four-deck units. *In charge—R. C. Johnson.*

• **SOCONY VACUUM OIL CO., INC.** No description received.

• **STANDARD OIL CO. (INDIANA)**

Company's line of lubricants and specialized products for the coal industry, including new line of coal spray oils. *In charge—George Harman.*

• **STEPHENS-ADAMSON MFG. CO.**

Company's Air-Sand Dry Coal Cleaner, utilizing the principle of dry cleaning coal by using fine sand-made fluid by means of air continuously bubbled through the sand. The perfect fluidity of the sand spreads the coal in a thin layer, permitting almost instantaneous float and sink separation. Perfected control of air distribution in the cleaner makes the specific gravity of the sand readily adjustable to float and discharge desired grades of coal.

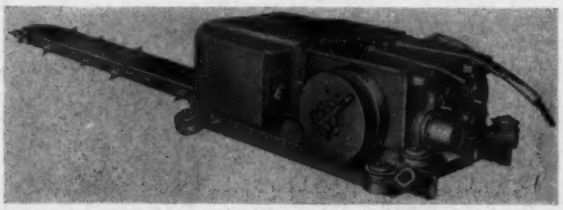
Also featured will be a unique system of Redler conveyor-elevators for conveying and elevating coal and other pulverized, granular, small lump, and flaky materials. Motivating force of the conveyor is a series of skeleton-links, which convey around bend corners as easily as on horizontal or vertical runs.

Also to be displayed will be the company's JFS Variable Speed Reducer, Saco speed reducer with first reduction through adjustable V-belts, Tellevel automatic storage control for controlling the level of bulk or liquid materials in bins or tanks, and the Truss frame carriers with pre-sealed cartridge type bearing units packaged with grease for life.

• **STERLING PUMP CORP.** No description received. *In charge—W. H. Boger.*

• **SULLIVAN MACHINERY CO.**

Company's improved, more powerful 7-B super shortwall cutter mounted on their two-speed, self-propelled power truck; a completely new, low height, mine car compressor called the Mine-Air; an improved type Lohite scraper loader which is powered with the Sullivan Lohite scraper hauler and phantom gear-trains which are embodied in the Sullivan 7-AU Universal track cutter and in the Sullivan 7-B super shortwall cutter. These



gear assemblies will actually be running at slow speed to show the various details of these features. Also on display will be a car puller, a complete line of pneumatic tools, tail rope sheaves for scraping, portable safety lighting cable, coal cutter parts, and other coal mining equipment.

Large display panels using colored translite pictures will feature Sullivan coal cutters in operation, with accompanying user testimonials to attest operating results. *In charge—L. A. Layman.*

• **SUN OIL CO.** No description received.

• **SUPERIOR CARBON PRODUCTS, INC.**

Complete line of company products, including electric motor and generator brushes for service on all types of electrical machinery used by the coal mining industry. Company has been manufacturing brushes for electrical machinery, from electric toys to 6,500-hp. motors, for the past 26 years. *In charge—R. J. Cook.*

• **TALCOTT, INC., W. O. & M. W.**

Complete line of belt fasteners to fill all requirements for the coal industry, featuring the special conveyor fastener for splicing conveyor belting of all widths and thicknesses, and the Talcott Acme patch fasteners for repairing torn or damaged belting. The regular conveyor fastener is made in short sections 1½ in. wide, and can easily be driven into the top or load side of the belt, making a close, pliable joint which conforms to

the troughing idler pulleys, and the tapered backs allow them to run smoothly under trippers, scrapers, and tandem drives without damaging the belt at the splice.

The Acme patch fasteners are especially suitable for repairing damaged belting, and are easily applied. They are so constructed that when driven into the belt they will draw the damaged sections tightly together, and the teeth automatically clinch when driven onto a steel surface placed under the belt. *In charge—M. W. Talcott and G. W. Little.*

• **TAMPING BAG CO., THE**

Company's Dummy-Maker and new type Seal-Tite tamping bags, the latest model of which is absolutely fireproof. *In charge—A. E. Pickard.*

• **TEMPLETON, KENLY & CO.**

Complete line of Simplex mine jacks for coal cutting and loading machines, rerailing mine cars and locomotives, cross timbering, car straightening, track work, post pulling, stretching heavy cable and trolley wire, tensioning chain hauls and conveyor belts; roof jacks; and other jacks for various special mining purposes.

The new Nos. M-8 and M-16 mine roof jacks will be on exhibit for the first time; these are rated at 8 and 16 tons, respectively, and are 50 percent stronger than their predecessors. The new No. 366 timber jack, which tightens against the roof and bottom for safely lifting wood or steel beams, will be demonstrated under a timber. This type of jack has a minimum height of 20½ in., which makes it easy to place heavy timber on the elevating bracket. *In charge—William Simpson.*

• **TENNESSEE COAL, IRON & RAILROAD CO.** See U. S. Steel Corp.

• **TIDE WATER ASSOCIATED OIL CO.**

Attractive and amusing puppet show, whose characters are a typical miner with many years of experience and a young lad who has just started mining. The scene takes place near a mine, and the conversation is concerned with questions about bearings, lubrication, expenses of operation, and other current mining problems. *In charge—Walter Sauer.*

• **TIMKEN ROLLER BEARING CO., THE**

With a display built around company's current advertising campaign, "Miles of Smiles", exhibits of Timken bearings and parts used in the mining industry, together with Timken rock bits used in connection with the removal of rock where it is encountered in connection with coal, are tied in effectively to a large replica of a Timken bearing on which is seated the Timken "Miles of Smiles" girl.

• **TOOL STEEL GEAR & PINION CO., THE.** No description received. *In charge—Leroy R. Brooks.*

• **TRACY CO., BERTRAND T.** No description received. *In charge—R. E. MacPherson.*

• **TYLER CO., THE W. S.**

Company's latest improved Type 400 electric screens for fine mesh screening, and a two-deck Ty-Rock for coarser mesh screening, together with samples of woven wire screen cloth, etc. *In charge—G. R. Delamater.*

• **UNION CARBIDE AND CARBON CORP.**

Joint exhibit of the Linde Air Products Company, National Carbon Co., Inc., Carbon Sales Division, and Haynes Stellite Company—units of Union Carbide and Carbon Corporation.

Linde Air Products Company's exhibit will feature welding and cutting blowpipes and various applications of the oxy-acetylene process that contribute to economical operation in the coal mining industry, together with Miners Lamp Union Carbide.

National Carbon Company, Inc., Carbon Sales Division, will display electric motor brushes and various other carbon products, including Karbate pipe, fittings, valves, and carbon brick.

Haynes Stellite Company will show hard-facing applications that increase the life of wearing surfaces, such as the application of Haynes Stellite alloy and Haystellite tube rod to coal undercutter bits. *In charge—J. J. Saclens.*

• **UNION WIRE ROPE CORP.**

Three types of exhibits showing some of the more popular types of wire rope constructions, for educational emphasis on proper selection of rope for any definite use. *In charge—T. A. Wattley.*

• **U. S. BUREAU OF MINES.** No description received. *In charge—W. P. Rieden.*

• **UNITED STATES RUBBER CO.** No description received.

• **UNITED STATES STEEL CORPORATION**

Joint exhibit of United States Steel subsidiaries, including American Bridge Co., American Steel & Wire Co., Carnegie-Illinois Steel Corp., Columbia Steel Co., National Tube Co., and Tennessee Coal, Iron & Railroad Co.

Four new steel room timbers, developed by Carnegie-Illinois Steel Corporation, will be shown; these are particularly adapted to use in large room operations, ranging from 16 to 20 ft. in length and designed for use with the customary wooden pit posts; they are particularly suitable for use at the working face in mechanized mines, an important saving being made possible by the wide places which these steel timbers permit. Where they are utilized, mechanical equipment can be used to the best advantage, and at the same time safe working conditions are assured.

Also featured will be the economy of Cor-Ten, the high tensile, corrosion-resistant steel; with this steel, mine cars may be reduced in weight without

affecting their capacity, or if desired, the capacity of the cars may be increased without increasing their present weight. In any event, longer life may be expected. Other uses of Cor-Ten and Man-Ten, as well as the special abrasion-resisting A-R Steel, are found in chutes and mine screens, where strength and wear resistance are particularly essential. Featured will be examples of these economical uses of special steels.

Additional items to be shown are copper steel Duroline pipe, as well as other tubular products of National Tube Company. Rail bonds, Amerclad rubber-covered electrical wires and cables, Tiger Brand hoisting and other wire rope, Excellay preformed wire rope, and aerial tramway waste disposal systems will also be displayed. Seen for the first time by mine operators will be the new conducting rubber which American Steel & Wire Company has developed. *In charge—H. G. Marsh.*

VIKING MANUFACTURING CO. No description received.

WATT CAR AND WHEEL CO., THE

Blueprints and pictures showing the latest type of mine cars built and designed by the company. *In charge—R. L. Edgar.*

WEIR KILBY CORP. No description received.

WESTERN CARTRIDGE CO.

Complete line of company's blasting caps mounted on a specially designed background panel, designed to make an easy visual presentation. *In charge—R. M. Lambie.*

WESTINGHOUSE ELECTRIC & MANUFACTURING CO.

Included will be a new type 300-kw, 275-volt completely portable mining substation on trucks, with over-all height of 46 in., the substation using sealed-off ignitron tubes—an innovation on units as large as this. Also shown will be a direct-current, general-purpose industrial motor, widely used by the coal mining industry; and several direct-current controls of the newest types, among which is an explosion-tested control of special application in coal mines. *In charge—P. H. Grunnagle.*

WEST VIRGINIA GEOL. & ECON. SURVEY. No description received.

WEST VIRGINIA RAIL CO., THE

Complete line of track work, including all of the standard designs of mine ties in common use by the coal industry, among which is company's featured tie with the self-locking clip. A recently redesigned clip, incorporating changes that are said to make the tie even more convenient to install than it has been in the past, will be shown at the Coal Show for the first time.

Also displayed will be the company's Safety Rail Frog, together with full line of rails and rail joints. *In charge—J. B. Haskell.*

WHEAT LAMP SALES, INC.

Complete line of lightweight, rechargeable battery lamps for every lighting purpose, as well as the general line of company's electric cap lamps and Koehler flame safety lamps. Shown for the first time will be the company's new Government-approved electric cap lamp with ingenious direct contact, push-turn charging, allowing for complete self-service. This simplified system eliminates all moving parts, permits each man to handle his own lamp in perfect safety, without requiring any current or voltage control or watching regulation during the complete charging cycle. The entire system of handling, racking and charging is unique, and will be shown in operation.

Weight has been reduced in the new cap lamp, and total light output substantially increased. A flexibility in light beam patterns permits of the selection of the proper and most efficient type of light for each specialized underground worker. The auxiliary bulb has been greatly increased in candlepower. *In charge—A. C. Dick.*

WOOD PRESERVING CORP. See Koppers Company.

Cincinnati's Music Hall—home of the 17th Annual Coal Convention and Exposition of the American Mining Congress

COAL MINE ILLUMINATION

By THOMAS ALLEN
Chief Coal Mine Inspector
State of Colorado

PART I—EARLY DEVELOPMENTS

PRIMITIVE man of the Stone Age became the first miner, because undoubtedly he dug some of the small caves entirely, and in many instances enlarged the spaces of larger natural caves. And he found out that flint rock dug out of chalk beds was easier to work into arrowheads and spearheads than the pieces of air-dried and air-hardened flint that he picked up on the surface. Therefore, Stone Age man dug pits through the dirt, clay, and rock covering flint-bearing chalk beds. From the bottom of these pits he excavated short, irregular galleries in the chalk beds in his search for the flints so necessary to him. These early miners must have used pieces of wood, or slim bundles of reeds or grasses as torches. They may have steeped this material in animal fat to give more illumination. They must have had some artificial light, and with this the first arrangements for underground lighting came into use.

Man slowly developed in intelligence for ages and ages. He slowly acquired ability in different handiworks, such as basket weaving and pottery work, but his methods of illumination did not progress from the use of burning fagots or reed lights for generations.

Then, possibly about the year 10,000 B. C., the use of oily fats in containers with some arrangement of a wick of wild cotton or wood fibre became known. With such development a more convenient, portable and longer-lasting light than the firebrand was available. These were the first lamps. Among the first containers of oil and fat were conch shells about the size of a man's hand. These tapered so that they had an end-shape like an open spout in which the wick could be placed. One end of the wick was immersed in the oil, with the lighted end projected from the spout of the shell. The shell shape was adopted by the early potters who made the first lamps of baked clay. The open spout construction was replaced by the pipe spout, then the idea of a lid or top was developed while the conch-shell shape was still retained. Lamps of these types were used about 4,000 B. C.

Metal mining by excavation started about 3,000 B. C. and continued through succeeding civilizations. Many references to metals and metal mining are made in Greek and Roman records. The earliest reference appears to be on stone tablets found near some Egyptian mines. Some of the old writings refer to the use of torches underground; lamps and parts of lamps, made of clay, have been found in old mines known to have been worked some centuries before the Birth of Christ.

Lamps used in mines were similar to those used outside generally, although the use of some arrangement whereby the lamp was attached to the head of the user seems to have been a special improvement for mines—possibly so that the slave carrying out ore in a sack or basket would have the free use of both hands to assist him in climbing ladders or steps in vertical and inclined shafts.

The fuel used in early mining lamps could only be olive oil, or oil or grease obtained from rendering the fat of animals. It is not possible that crude mineral oil was used as it was so little known at that time.

Lamps and torches continued to be used for generations—pottery and clay lamps being general for mining lamp construction. The metal lamp appeared in the palaces and temples of the ruling classes, but these would be too expensive for ordinary mining use. Overseers and managers in large operations may have used metal lamps, but it is more likely that on their tours of inspection their way was lighted by slave torchbearers.

Candles are supposed to have been made during the first century by our present calendar. The thought of such an arrangement for a light was built up from the use of a single reed or "rush" dipped in liquid grease. A reed dipped several times, allowing each coat to dry before the next coat of fat was applied, would build up the coating of grease to any desired thickness. Reeds did not make a good wick, so strings of twisted cotton were used instead. Animal fat (tallow) only was used in candle making.

The oldest civilizations mined only for metals. Coal was known to them and used a little, but they preferred wood and charcoal for household or smelting purposes. However, the Romans in their occupation of Britain, from 55 A. D. until 410 A. D., used coal in many places. Remains of slag from their smelters and coal and coal cinders in their fireplaces have been found in many places in England. Coal seams were easily accessible, so very little actual mining for fuel was done by the Romans. They simply dug shallow pits on the outcrops of the coal seams exposed at the surface. It was not until the beginning of the fourteenth century that real underground mining for coal began.

Early coal-mining methods were very crude; picks made of wood with metal points only, and wooden shovels, were used; wicker baskets and small sleds were the first equipment for haulage. In many mines the coal was carried by men or women from the working face to the outside whether the opening was a drift or shaft. The coal carrier, man or woman, ascending the ladders of a shaft, would carry a light in his mouth, so that he could use both hands to assist in climbing. Many of them attached the lights to their heads as the slave ore bearers had done in metal mines, centuries before. This practice was the beginning of the idea of the head lamp or cap lamp of the coal miner today. The use of the cap lamp did not develop in metal mines as it did in coal mines. Metal miners gradually accepted the hand light, particularly the candle, and later the carbide hand lamp, while the coal miner retained his preference for the cap lamp of different types.

With the beginning of coal mining, and during its growth in the fifteenth and sixteenth centuries, the appliances for illumination underground were equally as crude as the mining tools and other equipment used. Torches, rush lights, smoky oil lamps, and possibly candles were used with very little improvement over the system of lighting practiced for centuries in metal mining.

Candle making made considerable progress in the fifteenth century, and with this progress the candle offered an easy method of manufacturing a fairly satisfactory light. Candles could be made by anyone in their own home; therefore, their use became common. They were easily carried, and only a few of them were needed to last over a working shift of possibly 12 hours; hence the candle was readily adopted for mine lighting.

The whaling industry, starting as early as the ninth century and grown to be of considerable importance in the sixteenth century, had its influence on both oil lamps and candles. The whale was hunted and killed for the oil and fat in his body and for the candle wax (spermaceti) in his head, so that men might have better light.

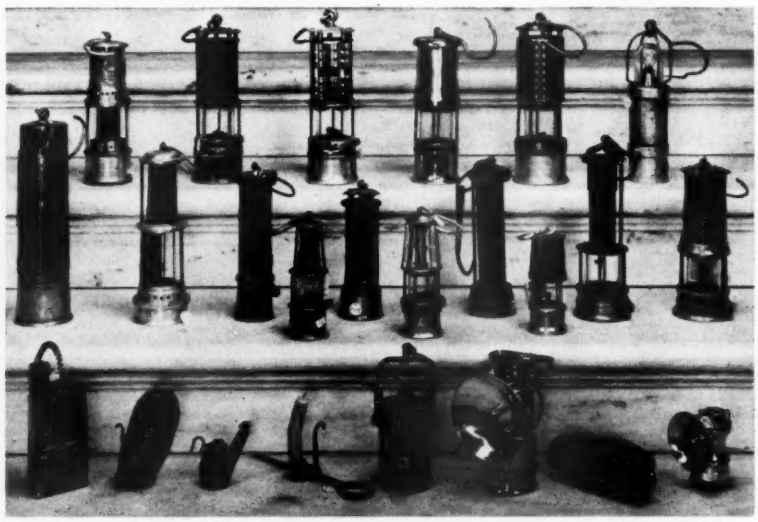
Open oil lamps made of metal were used to some extent about this time, as a picture in Agricola's book on mining, written about 1540, shows a metal miner carrying such a lamp. The cost of lamps made of metal must have been prohibitive, as in addition to the cost of the metal the lamps would have to be hand-made. It is possible for this reason that the candle held its place of importance as a light for coal mines for a long time. Its general use was an accepted fact until a new danger presented itself in the coal mines as they went deeper and deeper underground.

This new danger was a mysterious gas which, when it came in contact with open lights (candles or lamps), exploded violently, so that persons in the vicinity of such ignition were killed by the force of the explosion or burnt to death.

The earliest mention of noxious gases appears to be in 1555; this notice indicates the "blackdamp" of coal mines, and its effects on open lights. The first reference to a death by burning from explosive gas in coal mines appears in the *Parish Register* of St. Mary's Church, Gateshead on Tyne, England. The record reads, "Richard Backas burnt in a pit October 14, 1621."

This new danger was terrifying. There were no means of preventing this gas from coming into the workings, because when the coal was excavated the gas was given off. Ventilation was not understood—generally it was caused only by natural conditions. Even if an air current was passing through the roadways of a coal mine, it did not sweep out the advance working places. The problem was how to keep the miner working at the face in the presence of explosive gas. He must have a light so that he could see to work, and an ordinary candle ignited this gas. The answer appeared to be a smaller light, as it was thought that such a smaller light would not have enough flame to ignite the gas. Therefore, smaller candles were made and tried in gassy mines. They were, of course, a failure; gas ignitions continued to occur, as the temperature of the smaller candle flame was equal to the temperature of the larger flame. The difference in the two flames was only in quantity of heat, not the intensity of heat or temperature of the flame, and in either case the temperature was sufficiently high to ignite the gas. These were the first attempts to provide a light for coal mines which would be safe in explosive mixtures of gas and air.

With the failure of the small candle to give the required safety, many schemes were tried to give the miner an adequate and safe light with which to work. Attempts were made to use the phosphorescent glow from partly decayed fish, fishskins and certain types



Varied Assortment of Mine Illumination Equipment (reading from left to right)

Top row—American type for gas detecting; American type iron Wolf miner's lamp; American modern Wolf lamp; American first type of Wolf used in Colorado; American modern Koehler lamp; and German type electric hand lamp, one of first lamps brought to Colorado with rescue apparatus

Middle row—Pieler lamp for gas testing, using alcohol; American lamp with ladder of wires for gas testing; old Davy lamp with shield; early type Baby Wolf American; old Davy lamp, official's type; new type Baby Wolf American; old Davy lamp, miner's type harp lock (first lamp used in Colorado); early English type of small safety lamp; old type Clanny lamp; and old type improved Clanny

Bottom row—English type open oil lamp; American mule-driver oil lamp; American coal digger oil lamp; American metal miner candlestick (from Matchless mine at Leadville, Colo., operated by Tabor); American metal miner old carbide hand lamp; American metal miner new carbide hand lamp; American coal miner carbide and water carrier; and American new type carbide lamp

of fungus. In these cases illumination was very much a secondary factor; safety from gas ignition was the major thought. In shallow mines and shaft sinkings, especially, mirrors were set to reflect daylight into the workings. Needless to say, this arrangement was unsatisfactory.

Methods of keeping working places clear of gas by burning it were used. In one method candles were kept continually burning to consume the gas as it was given off. The other system comprised the burning of any quantity of gas which had accumulated in the place by igniting it with a candle on the end of a long pole, the person doing this standing back some distance, and thrusting the pole with the lighted candle on its end into the place to be cleared. These daredevil souls were called firemen. Later these firemen learned that small percentages of gas in the mine air might be detected by close observation of changes in the candle flame when it was slowly contacted with the edges of gas mixtures. These men were our first gas watchmen, or as they are more generally named today—firebosses.

The fireman's examination gave him some idea of the size of a gas accumulation. If the body of gas was too large for him to "fire," he resorted to another method for its removal; namely, by taking a large cloth and waving it around in the place. In this way he fanned or "brushed" out the gas—the disturbance he made in this way caused more rapid diffusion. By repeating the brushing while walking slowly from the face of the place to its junction with the entry he was able to clear away the greater portion of the explosive gas. The practice of using a candle or an open light for detecting gas was continued until the beginning of the present century. As late as 1906 I saw a mine official open a safety lamp and use the open flame for fine detection. "Brushing" gas was also practiced until very recently, when both the use of an open flame for gas detection and brushing gas were prohibited by mining laws. It is possible that brushing is practiced yet in remote localities.

During the sixteenth and seventeenth centuries gas explosions and ignitions from the use of open lights continued to happen in the mines in England. Finally in 1750 the steel mill was invented by Carlisle Spedding. This appliance consisted of an iron frame supporting gearing connected to a steel disk. A handle attached to the gearing transmitted motion so that the steel disk rotated rapidly. A piece of flint was held up against the disk when it was in motion. This caused a continuous shower of sparks; the miner worked or tried to work by the indifferent light provided for him by an assistant who operated the steel mill.

The steel mill was thought to solve the problem of coal-mine lighting, but in May, 1812, a disastrous explosion took place in the Felling Colliery, Newcastle - on - Tyne, England, in which 90 miners lost their lives. The parish priest, Rev. Hodgson, horrified by this disaster, gave great publicity to the dire lot of the coal miners under his care.

This action finally drew the attention of the British Government, and Sir Humphrey Davy, a great scientist, was appointed to conduct experiments to find a safe light for coal mines. As a result of his work Davy discovered the principle of the safety lamp gauze, and produced from this discovery the Davy lamp in 1815. This type of lamp, with some improvements, continued to be used for 100 years. There may be some in use at this time in small mines operating in out-of-way places.

Davy offered the first thought of an electric lamp for use as a safe light in coal mines. In 1800 he showed the arc light at the Royal Institution in England. During his earlier experimentation in searching for a solution of the coal mine lighting problem, Davy thought of an electric light completely enclosed in glass.

About the same time that Sir Humphrey Davy was working on his lamp, George Stephenson, who is better known for his improved railroad locomotives, discovered the same principle as Davy, and designed a safety lamp known as the Stephenson or "Geordie." The word "Geordie" is the north of England corruption of the name "George" or "Georgie." Stephenson was well enough known to the miners in his district to be addressed by his first name.

Stephenson's lamp differed from Davy's in that Davy only surrounded the flame by a closed long cylinder of screen wire or gauze; Stephenson fitted an open-top glass cylinder inside the gauze and covered the top of the glass with a copper cap perforated by many small holes.

The lamps show the different types of men. Davy was a scientist, and knew little of coal-mine workings. Stephenson was a mine mechanic; he had much practical experience, and knew of the velocities of air currents in mines; also he knew of strong gas blowers from coal faces. In fact, some of his early studies of the design of a lamp were conducted on the gas blowers in the mine where he was employed. Therefore, Stephenson protected his flame from moving air currents and the force of a gas blower by placing the glass cylinder around the flame and inside the gauze cylinder. Davy used only the gauze cylinder. The Davy lamp was only safe in air currents of not more than 6 ft. per second; Stephenson's lamp was safe in velocities of 13 ft. per second.

Davy and Stephenson both had as a major thought in their work the development of a lamp which would not ignite explosive gas under ordinary conditions; illumination came second in their thoughts.

About this time, and for some time before, a Dr. Clanny, of Sunderland, England, was experimenting on coal miners' lamps. He finally designed the Clanny lamp, using the same principle as Davy and Stephenson. But Dr. Clanny, being a mine doctor, knew that many of the injured persons he treated might have avoided the accident which caused the injury if they had had a better light while working. Therefore, in his lamp he placed a heavy short glass cylinder around the flame and placed the safety gauze on top of this cylinder. In this way illumination was not obstructed by the gauze. The glass cylinder also made the Clanny a little safer in air currents—it was safe in velocities up to 8 ft. per second. The Clanny lamp is without doubt the first thought that improved illumination would help to reduce accidents.

All of these lamps, however, gave but little light—the Davy and Stephenson averaged about one-fourth of the illumination of a candle, while the Clanny gave possibly between one-third and one-half the light of a miner's candle.

Safety lamps were accepted by the miners in gassy pits as a necessary evil. They were costly and gave less light than a candle or small open-flame lamp; for this reason they were not used in non-gassy mines. Artificial ventilation and methods of directing air currents ("coursing the air") through the workings of a mine became more or less common practice. James Spedding, son of the inventor of the steel mill, is given credit by some writers for introducing "air coursing" in mines with some arrangement of ventilation. This caused an outcry from workmen that the reasons for such explosions was lack of ventilation because the mine

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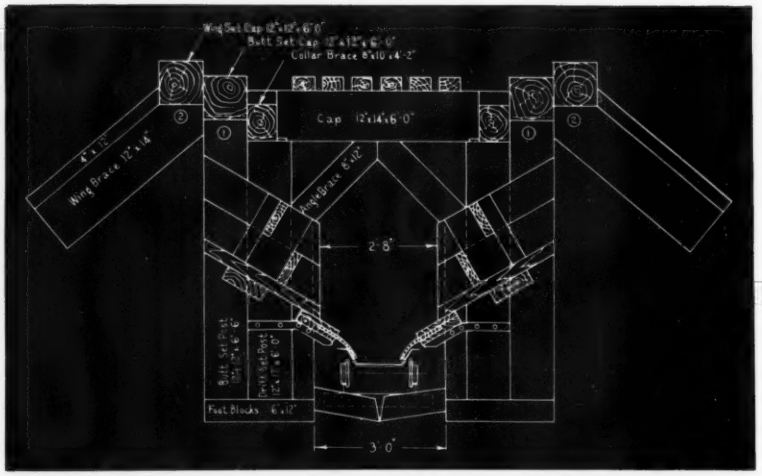

Fig. 1. Section through draw set in experimental drift with shaker conveyor. No. 1 butt sets and No. 2 wing sets installed only at chute positions. Note removable chute bottoms extending out onto conveyor pan

Kennecott's Ray Mines Experiment with SHAKER CONVEYOR

● ***Results in One Drift Where Conveyor Averaged 70 Tons Per Hour Warrant Extension of Experiments to Four Drift Section***

By R. W. THOMAS
General Manager
Ray Mines Division
Kennecott Copper Corporation

THE depressed industrial conditions of the last 10 years, with the resultant low price of metals, have made necessary a thorough consideration of underground mining practices. The actual extraction of ore presents a rather limited field for cost reduction, as the cost of mining has a close relationship to the method employed and is chiefly influenced by the character of the ground in which the operation is conducted. Attention has therefore been directed to possible savings that might be accomplished through a decrease in the amount of development expenditures required in advance of actual ore extraction. To accomplish this, thoughts have turned to the economic transportation of ore by mechanical means on the mining sill, as this would permit reduction in the number of drifts required on the haulage level and at the same time eliminate numerous raises from the haulage level to the mining sill itself.

Slushers Investigated

Such mechanical transportation of ore is now being accomplished in many instances by "slushing," a practice which has come into common use during the past decade. Investigation was made into the use of slushers to determine their practicability in connection with mining operations at the Ray mines of Kennecott Copper Corporation. However, the character of the ground at Ray makes it impossible to maintain drifts on the mining sill of sufficient width and height to permit the use of a scraper of a size that would result in economical transportation of the ore. The use of conveyors, both of the belt type and the pan type, was then given consideration, but these also would be impractical in drifts where frequent timber repairs are necessary because of the ground weight which is prevalent at Ray.

Coal Mining Practices Considered

Attention was ultimately directed to coal mining which, due to economic conditions, has been forced into almost complete mechanization, and consideration was given to the use of shaker conveyors which are now used extensively in modern coal mining practice.

The problem at Ray was discussed with representatives of the Goodman Manufacturing Company, manufacturer of shaker conveyors, and it was found that this equipment, which consisted of a driving unit and a pan or trough made up of sections supported on wheels or rollers, could be installed in a drift of small dimensions, namely, 3 ft. in width in the clear. The construction of the pan in sections also minimized the difficulty that might be experienced in making necessary timber repairs, as these repairs could be made without disrupting the entire conveying system by merely removing a section of the pan.

Statistics on tonnages handled by this equipment in coal mining practice indicated that a satisfactory tonnage could be conveyed, and it was therefore decided that a unit would be purchased to determine its adaptability by actual operation to mining practices as they are conducted at Ray. In August, 1939, a shaker mechanism together with 150 ft. of pan in 10-ft. sections was ordered, and was received in October of the same year. A min-

ing drift was driven, the equipment installed and put into operation during the latter part of November.

Timber, Chute and Pan Setup

The experimental drift was timbered with sets on 5-ft. centers, consisting of 12 x 12-in. posts, 6 ft. in length with 6-ft. overall, 12 x 14-in. caps. This set, when angle braced, gave a drift 3 ft. wide in the clear with a vertical clearance of 7 ft. from the base of rail to the underside of the overhead lagging.

Opposing chutes controlled by wooden gates were installed and so constructed that the sides and bottoms of the chutes extended approximately 2 in. into the drift with a clearance between the opposing chutes of 2 ft., 8 in. This clearance was decided upon in order that the chutes would not interfere with the large boulders in the ore when they were being conveyed along the pan. The overall width of the pan in use at Ray is 21¼ in., and it was therefore necessary to design a removable extension to the chute bottom in order that the ore could be run on to the pan without spillage. In the first instance an effort was made to control the amount of ore to the pan by operation of the chute gates, but this proved to be impractical. A piece of canvas transmission belt was then fastened to the removable chute bottom in such a manner that it extended into the pan.

Hopper Effect from Removable Chute Bottoms

The two removable chute bottoms, when installed under the opposing chutes, give a hopper effect which distributes the ore evenly on the pan. By adjusting the depth to which the belting strips extend into the pan, the pan can be loaded uniformly to its correct carrying capacity. These removable chute bottoms, which are 7 ft. in length, together with the belt extensions, are illustrated in figures 1 and 2. Figure 3 shows the loading of the pan with a heavy run from the chute, and clearly illustrates the hopper effect of the removable chute bottoms. Figure 4 shows the uniform loading of the pan, and figure 5 pictures the discharge end of the pan together with a small portion of the shaker drive and the columns by which it is anchored.

No attempt will be made to give detailed description of this installation, as it is felt that the accompanying photographs and illustration are self-explanatory. It might be said that the pan operates on the original track used in driving the drift, which consists of 12-lb. rail at 18-in. gauge.

Fig. 2. Ore feeding into conveyor line. Note removable chute bottoms affording even distribution.

Fig. 3. Heavy ore run from chute loading onto pan. Hopper effect of removable chute bottoms clearly evident

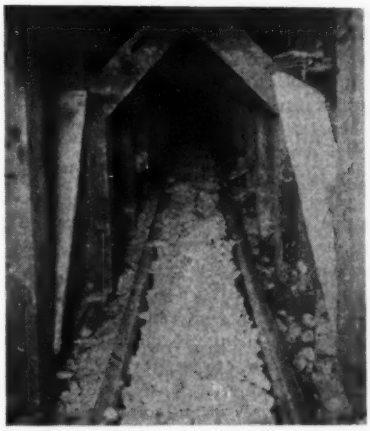

Fig. 4. Sizable section of pan line, showing uniformity of loading

Fig. 5. Discharge end of pan, showing part of conveyor drive and columns by which it is anchored

More Extensive Test Warranted

During test periods the shaker conveyor handled an average of 70 tons per hour. The results of this experiment have been of such a nature that they warrant a further testing of the equipment on a larger scale, and a four-drift section is now being developed in which the mining drifts will be spaced at 30-ft. centers. The drifts will be 150 ft. in length, with extraction chutes spaced at 25-ft. intervals.

Eagle-Picher Constructs Auxiliary Cone Unit

The Eagle-Picher Mining and Smelting Company has completed an auxiliary cone unit at the differential-density plant of the company's Central mill near Cardin, Okla., according to G. C. Niday, of Miami, Tri-State manager of mines and mills for the company. A description of this process appeared in the February MINING CONGRESS JOURNAL.

The auxiliary unit will supplement two cones originally installed in the plant, and will replace one of the latter as a storage cone in maintaining a proper and ready medium for the continuous operation of the original two. It will serve to equalize the load of the two original cones and at the same time add to the flexibility of the plant's operation, which previously has been handling around 400 tons an hour through one cone. It will also permit treatment of larger tonnages, with a potentiality of doubling the present capacity.

The auxiliary unit is similar in design and construction to the two original inverted cones, 20 feet in diameter and 20 feet in depth, of steel construction. The third cone was placed in operation late in February.

The March of COAL MINING

Ten Years of Progress

THE DEVELOPMENT of CONVEYOR MINING

By G. B. SOUTHWARD
Mechanization Engineer
American Mining Congress

THERE is some argument as to where and when conveyors were first used in coal mining, but no exception can be taken to the statement that conveyor mining, as we know it today, was largely developed in the thin seams of central Pennsylvania. Other fields—Wyoming, Alabama, Anthracite—were making concurrent development, but central Pennsylvania had the advantage of a large number of mines with generally similar conditions, all faced with the common necessity of devising an economical method to mine low coal, and working together toward the same end.

The first thing which had to be decided in the adoption of conveyors was the mining plan; this is still a problem, but it is comparatively simple to what it was 10 or more years ago. The suitability of conveyors to long faces appears to have been so apparent that several companies in this field, as well as in others, did some experimental work along this line. However, they discovered, as did the others, that the roof problems introduced by long face mining were so difficult that this method, instead of simplifying a conveyor operation, complicated things to the point of impracticability.

The room and pillar system, therefore, was found to be the one most easily adapted to conveyor mining, and it was further found that the rapid rate of extraction and the concentrated working area resulted in a more favorable roof action and a higher coal recovery than had previously been possible with hand loading.

The early operating practices were along more or less uniform lines; each room was worked by one crew who remained in the room, and took as many cuts per shift as possible. Single units were the rule (as shown in Figure 1), although a few operations had two single units in a panel, working to the right and left off the entry. The heading development plans were also essentially similar, using single units which were transferred back and forth at intervals between the entry and the air course; taking the rock in the entry while the air course was being driven. This was later amplified so as to advance both the entry and the air course simultaneously with two conveyors and a short cross conveyor to bring the coal to a common loading point. This plan is shown in Figure 2.

The two preceding paragraphs describe what took a number of years to accomplish, and cover the general situation as it existed in 1935, or thereabouts. The sketches and charts in Figures 1, 2 and 3, which show the records of one company as compiled about five years ago, are fairly typical of the field as a whole at that time. Since then, practices at different companies have improved and developed along divergent lines, and the remainder of this article will outline the subsequent experience of the company whose charts are submitted here, and will explain the basis on which their improvements were planned and made.

This company, among others, discovered early in the game that conveyor mining could not advance through guesswork, and that accurate operating analyses must be made. In this respect, as in the case of the mining systems and the operating practices, there was no precedent to go by; new items of cost had entered into the picture, and it was difficult to evaluate the relative value of each separate operation that was an integral part of the whole system. Time studies were devised and used to show the efficiency of the face crews, but after these had served their purpose, it was apparent that an average daily performance in a room was not sufficiently indicative

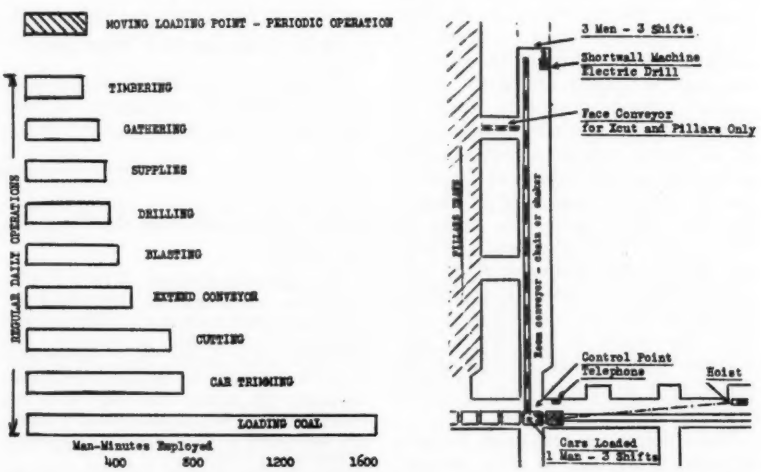

Fig. 1. Room Mining and Pillar Recovery. The chart shows the amount of labor used in an average day for all regular operations, and includes periodic operations adjusted to a daily proportion

Fig. 3. Labor used for developing and mining an entire room panel, with each operation expressed as a percentage of the total man hours worked

to furnish a basis of judgment. Therefore, in order to determine what was actually being accomplished, it was necessary to include all items that went into mining a complete room panel—from the entry development down to the extraction of the pillars.

Figure 1 shows the room mining labor as used in the system illustrated by the sketch. Figure 2 shows similar information for the entry development, which included the rock brushing. Combining these two, the chart in Figure 3 gives all labor used in the entire panel, and it will be noted that there are four major items of cost—coal loading, rock brushing, car trimming, and moving the equipment.

Each of these operations constitutes a potential source of cost saving, and from this point the procedure in this district began to diverge. Some mines concentrated on reducing the loading cost by the introduction of mechanical loading, but this particular company has preferred to give their attention to the operations of car trimming, rock brushing, and moving the equipment. A major reason in their case was that they believed their unfavorable top conditions would make mechanical loading difficult.

The item of car trimming at the loading point came in for first attention. Since one man is able to serve several units in this capacity, it is obvious that the car-trimming cost will be in inverse proportion to the number of rooms worked in a unit, so their first step toward lower costs and greater productivity was to install multiple room units—first two, then three, and finally four—discharging onto a short gathering conveyor.

The gathering conveyor also makes possible greater concentration of working area, simplifies car servicing, allows for increased supervision, and decreases the labor used for installing the car loading points by decreasing the number of these stations required in a panel. It was a natural sequence to amplify this idea by having one long belt conveyor in the panel entry which would reach clear to the face heading. This eliminates all intermediate gathering points, but complications are introduced by the greater purchase price of a long belt as compared to a short gathering conveyor. Calculations of the equipment investments are a matter of simple arithmetic, and on this basis alone, the expense of a belt might not be justified; however, there is a credit gained through increased coal production made through eliminating periodic idle time incurred while the loading point is being moved. Taking all of these factors into account, this company decided in favor of the gathering belt, and are experimenting with this type of equipment. Other companies, incidentally, have arrived at the same conclusion.

The third item of major cost is the rock brushing. The coal in this mine is less than 4 ft. in height, making rock brushing necessary along the haulageway in the room entry, and it will be noted in Figure 2 that a plan and procedure had been developed whereby coal and rock were loaded simultaneously as the entry advanced. However, the slate was hand loaded into the mine cars, and the charts in Figures 2 and 3 show the large amount of labor that this operation required.

The installation of the belt conveyor did not entirely eliminate this labor, as it is necessary to take height for a manway, and the recent answer made to this problem was to eliminate the hand loading by using a scraper in driving the haulage entry. This equipment is used to load both coal and rock, and its operation has been found economical and satisfactory.

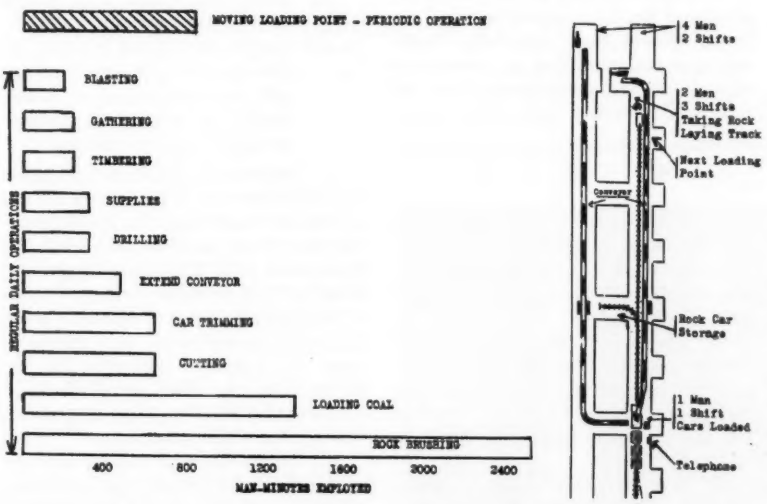

Fig. 2. Entry Development. The chart shows the amount of labor used in an average day for all regular operations, and includes periodic operations adjusted to a daily proportion

With the COAL DIVISION

of the AMERICAN MINING CONGRESS

Tentative SAFETY RULES

● ***Submitted to the Committee on Safety***

SPECIAL RULES for CONVEYOR MINING

1. Any dangerous condition, or suspected dangerous condition, shall be reported immediately to the foreman.

2. Regular timbering and safety posts shall be set as specified by the management, and additional posts when necessary to insure safety.

3. When posts are required between the conveyor and the face, these shall not be taken down, when cutting or moving the conveyor forward, until substitute posts have been set.

4. The conveyor should be stopped at regular intervals so that the roof can be properly tested.

5. Shooting standards should be required to be followed in loading and firing all shots. During the blasting, employes shall be in a place of safety as specified by the State Mining Laws. (See Special Rules for Handling Explosives.)

6. No shots should be permitted to be connected while machinery is in motion or in operation at the face.

7. Where auxiliary fans or vent tubing are used for ventilation, in case of any interruption in their operation, the management shall specify whether or not the workmen should leave the face until the equipment is again in running order—local conditions, of course, governing.

8. Workmen should not be permitted to ride on chain conveyors, and they should be allowed to ride on belt conveyors only at such times and at such places as may be specifically designated by the management. Under no circumstances shall they ride closer than 40 feet to a head or tail piece, nor get on or off the conveyor except at places designated by the management. Where men are permitted to ride the conveyor, there should be some means of signalling the operator so that the conveyor may be stopped in case of an emergency.

9. When crossing conveyor line, men should be instructed to look towards approaching load and use extreme caution. No workman should be permitted to cross over a conveyor, near the tail piece, while it is running in a reverse direction.

10. When transporting material on the reversed conveyor, such material should be removed not less than 15 feet from the tail pieces. When loading timber or other supplies on the reversed conveyors, the end of such material nearest the tail piece should be placed first on the conveyor, and in unloading, the end of such supplies farthest from the tail piece should be lifted first. The conveyor should be stopped while removing any material too heavy for one man to handle.

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The Special Rules shown here were prepared by the committees on Conveyor Mining and Mechanical Loading, and are submitted as a tentative report for the consideration of the Safety Committee and others interested.

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11. The signal system should be maintained in an operating condition. The control switch for the signal system should be located at the face and near the workmen.

12. The conveyor operator should not be permitted to start any equipment or connect power to cables leading to the face until he has received the proper signal from the workmen at the face.

13. When junction boxes or plugs are used at the face to operate mining machine, face conveyor and drill from a main cable, the practice of using the plugs to start and stop any of the units should be prohibited.

14. Power cables should be supported off the mine floor, on plugs or other methods, to within 30 ft. of the face. Power, signal and shot firing cables should be so located that they cannot come in contact with one another or be damaged accidentally.

15. Moving the face conveyor by setting a post between the roof and the coal-carrying chain should be prohibited.

16. Coal drills or cutting machine should not operate near the tail end of a conveyor which is running reversed.

Mechanical and Electrical Maintenance

17. It is recommended that a special maintenance and repair crew be employed to make daily inspections of all conveyor equipment. Where such a crew is not employed, then the conveyor men should be required to make regular inspections during each shift, giving special attention to the following items:

(a) Conveyor chains should be properly tightened, and pans kept in alignment;
(b) All defective chain flights, bolts, nuts, pans, etc., should be properly replaced;
(c) Guards for movable parts and wiring should be kept in place, and any damage or breaks should be repaired or reported promptly to the repairman.

18. Equipment should be lubricated at such intervals as designated by the chief electrician. Lubricating or greasing should not be permitted while the equipment is in operation, except exposed ends of rollers on belt conveyors.

19. Special attention should be given by the repairmen to see that all equipment is properly grounded as instructed by the chief electrician, and protected by fuses of a capacity specified by the chief electrician.

20. All splices and connections on cables must be properly insulated at all times. Cables should be inspected regularly and defective wiring repaired or reported promptly to the repair-

man. If a cable sparks or arcs, the machine must be stopped immediately, and not started again until the defect has been corrected.

21. Power must be disconnected when making splices to cable or repairs to electrical equipment, or when putting in shearing pins.

22. In the event of a breakdown, damage to equipment, or changing pans, warning signs shall be placed on the starters or switches to warn persons from starting same while repairs are being made.

23. Head ends, drives and tail pieces should be free from coal spillage, and all spillage along the main conveyors should be loaded out at least once each shift.

24. At no time should a man be permitted to use his hands when cleaning under conveyors or around tail or head piece.

25. Good housekeeping reduces accidents, and walkways along the conveyors should be kept free of coal, slate, supplies and material. Timbers, pans, chains, and other supplies not in use, should be stored where designated by the foreman.

SPECIAL RULES for MOBILE MECHANICAL LOADERS

1. When the machine operator finds or suspects a working place to be dangerous, he shall report to foreman and shall not operate machine except in presence of foreman or other safety official while bad condition prevails.

2. Regular timbering and safety posts shall be set as specified by the management, and additional posts when necessary to insure safety. When posts or timbers are accidentally knocked down, the machine shall be stopped until these are reset.

3. From time to time during the progress of their work, the operator or his helper must stop the machine and examine the working place to see that it is not becoming unsafe. Should conditions arise that cannot be corrected, suspend operations and report to the official in charge.

4. Machine should not be in operation when posts are being removed.

5. Loader helpers must not work or stand at face ahead of frontal attack loaders while gathering mechanism is operating.

6. Adequate body clearance shall be provided for in working places to keep operators from getting caught against ribs or timbers.

7. Employes in mechanical sections shall recognize the safety importance of clearance for all men in the crew and shall prevent accumulations of coal or refuse on or near the track. Ties, rails, and timbers must be kept back out of the way.

8. Extreme care must be used in moving machines from place to place. The operator must keep his conveyor boom in such a position to prevent knocking out timbers or coming in contact with power lines.

9. When moving the machine, the operator must ride the step provided for that purpose. The operator of loading machine should not allow anyone unauthorized at the face while the machine is in operation. No person shall stand along the side or pass by boom while the same is being moved.

10. Loader should not be permitted to be trammed from place to place with gathering head or conveyors in motion.

11. Loader should be required to be in low gear when loading coal, except where the management specifies that this procedure is not necessary.

12. Where headlights or tail lights are provided, machinery shall not be permitted to operate with lights out, except in emergencies.

13. Operators of any loading machine that is not provided with a cable reel must remove all excess cable from the top of machine and put in a safe place at the entrance of the place, and not take more cable to the working face than is required.

14. The fuse on the cable must be examined at the beginning of each shift and before putting the nips on the wires care must be taken to place the cold (negative) on the wire first and when disconnecting remove the hot (positive) nip first.

15. All splices and connections on cables must be properly insulated at all times. Cables should be inspected regularly and defective wiring repaired or reported promptly to the repairman. If a cable sparks or arcs, the machine must be stopped immediately, and not started again until the defect has been corrected.

16. Power must be disconnected when making splices to cable or repairs to electrical equipment.

17. Shooting standards should be required to be followed in loading and firing all shots. During the blasting, the employes shall be in a place of safety as specified by the State Mining Laws. (See Special Rules for Explosives.)

18. No shots should be permitted to be connected while machinery is in motion or in operation at the face.

19. Where auxiliary fans or vent tubing are used for ventilation, in case of any interruption in their operation, the management shall specify whether or not the workmen should leave the face until the equipment is again in running order—local conditions, of course, governing.

20. Mine cars should be loaded so there will be a minimum spillage.

21. Empty or loaded cars should not be stored in place in which cutting machine is operating.

22. All cars should be properly braked or blocked when stored.

23. Controls should not be permitted to be left while loader is in operation or motion.

24. Loading machine should not be bumped with cars.

25. Lubricating should not be permitted when machinery is in motion, except when the machine is so arranged that this can be done in safety through oil pipes and guards.

Good housekeeping promotes safety

On Selecting a CRUSHER

By WILBUR GORMAN

Crushing and Cement Division
Allis-Chalmers Mfg. Co.

EVERY crushing problem primarily involves the reduction of material from a given size to a predetermined fineness at a preselected hourly tonnage. For the greatest economy the physical characteristics of the material to be crushed and the flow sheet of the entire plant should be carefully studied when selecting the crushing machinery.

Gyratory crushers have greater capacity in reducing material to any given size than jaw crushers of equal receiving openings. This is due to the larger crushing and discharge area of the gyratory crushers rather than to other inherent characteristics of the machine. Jaw crushers, therefore, are usually used as primary breakers for the reason that they provide a larger receiving opening for a given capacity. Gyratory crushers are used as primary crushers in plants of very large capacities or where conditions permit smaller receiving openings with average capacity, but their principal application is for second and third stage crushing. If the final product is smaller than can be economically produced by gyratory machines, the final reduction is usually made in crushing rolls or rod mills. Hammer mills also have application when non-abrasive materials are handled.

Characteristics of Gyratory Crushers

Gyratory crushers operate on the same fundamental principle as Blake jaw crushers. The crushing head corresponds to the reciprocating swing jaw, and the concaves correspond to the stationary jaw. The capacity of any crusher is limited by its ability to discharge crushed material; therefore, the gyratory design, with its larger discharge area, has a greater capacity than a jaw crusher of equal size receiving opening. Jaw and gyratory crushers may be furnished either with conventional straight jaw plates (or mantle and concaves) or with non-choking crushing surfaces. The term "non-choking" is an anomaly, in that the crushing chamber provided with this type of surface really does have a choking point—just as any other crushing chamber. With non-choking surfaces this point is moved upward to a zone in the crusher where the movement between the jaws is not sufficient to cause packing, and where the bulk of crushed material is low. Below this zone the contour of surfaces is such that the amount of rock-fall for any given movement of swing jaw steadily increases. This prevents choking and increases capacity because it permits a rapid discharge of crushed material. The shape of the crushing surfaces forms a parallel zone towards the end of the crushing chamber, accounting for a more uniform product than produced with straight crushing surfaces. Non-choking crushing surfaces wear very uniformly and result in lower scrap loss than straight plates. Non-choking jaw plates and concaves find the greatest application in secondary crushers.

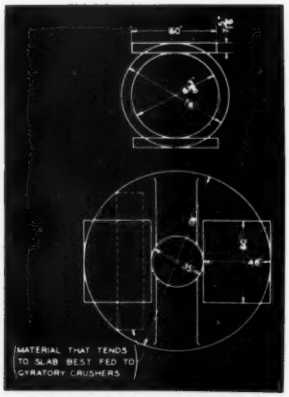


Fig. 1. Relative discharge area of 1—48-in. gyratory and 2—48-in. x 60-in. jaw crushers (above), and relative feed area of same size gyratory and jaw crushers (below)

Fundamental Designs of Jaw Crushers

Jaw crushers are fundamentally of three different types; the Blake, Dodge and single toggle. The principles and comparison of the three designs are shown graphically in Figure 2. Blake type jaw crushers utilize a double toggle system to transfer the motion from the pitman. The swing jaw is pivoted at the top so that the longest movement takes place at the bottom of the crushing chamber on the finer material. The leverage is greatest at the top of the crushing zone where the maximum crushing pressure is needed to crush the larger pieces. Because of the long movement at the discharge, the Blake crusher permits rapid elimination of finished material, affording a high capacity regulated by the open side setting of the machine.

The swing jaw of a Dodge crusher is pivoted at the bottom so that the largest movement occurs at the top of the jaw. The constant discharge area limits the crusher output but provides a very uniform size product.

The single toggle crusher has the eccentric mounted directly in the swing jaw so that the crushing motion is somewhat elliptical, depending on the location of the toggle plates. Some manufacturers of this type of crusher claim the elliptical swing jaw motion produces forced feeding. This is true to the extent that the downward thrust of the jaw is confined to the upper portion of the crushing zone. The zone of downward thrust depends on the location of the toggle plate which acts partially as a pivot for the jaw. Investigation by means of a motion diagram has shown at least one crusher of this type to have a downward force feed motion at the top of the jaw and a slightly upward component of motion at the lower end of the swing jaw.

- DODGE -	- BLAKE -	- SINGLE TOGGLE -
C.S.-O.S.	C.S. - O.S. = O.S.-C.S.-THROW	C.S. - O.S. = O.S.-C.S.-THROW
SMALL CAPACITY	LARGE CAPACITY	LARGE CAPACITY
UNIFORM SIZED PRODUCT	PRODUCT SIZE ACCORDING TO O.S. SETTING	FAIRLY UNIFORM PRODUCT
MOST MOVEMENT ON LARGE ROCK	MOST MOVEMENT ON SMALL ROCK	GOOD MOVEMENT ON ALL ROCK
LEVERAGE ON SMALL PIECES	LEVERAGE ON LARGE PIECES	

Fig. 2. Comparison of different types of jaw crushers

Capacities of these machines run

(*Continued on page 76*)

FINANCING PRIMARY MINING VENTURES

● ***Five Causes Contributing to Difficulties in Financing Mine Development Outlined, Along with Suggested Remedies. Mining Can Smooth the Path by Adopting Certain Corrective Actions and Pressing Widespread Publicity***

By CARL J. TRAUERMAN
President
Ruby Gulch Mining Co.

TODAY, and for some time past, we have had a stagnation in primary mineral developments, and the modern "pioneer" has had his initiative and courage stifled by society, of which he is a part, and only in a small degree has this stifling been due to natural causes. There is an appalling dearth of public and private funds for the primary mining ventures and for nearly all other forms of "venture" capital, but more pronounced in mining than in general business.

Primary mining, we are glad to state, has been put into the category of small business by our present government administration, and it has completed a survey to ascertain our ills and try to help us. The ordinary small business does its financing at home, where its partners or stockholders know something about the business, such as a store or a small factory. Primary mining ventures usually must be financed where there is money, in districts usually far away from the mine and amongst people who do not know nearly as much about a mine, as they do about a mercantile business. To dishonest mine promoters this is an advantage, but to honest promoters it is a distinct disadvantage. However, to the honest promoter and to the general mining industry, this is a fact that is going to be with us for a long time and while we cannot bring the mines to the financial centers, we can take steps to bring the mines to the minds of the people in the financial centers. In short, we can make public and private capital mining-minded.

At Denver I asked the SEC for figures on the amounts of primary mining venture registrations and amounts coming in under the exemptions. Against these totals I asked for figures showing actual sales of securities registered and exempt. I made the statement at that time that not over 15 percent of the registered primary mining securities had been sold and not over 25 percent of the exempted primary mining securities which come under the jurisdiction of the SEC. The request and prediction were made in October, 1936, and while figures on exempted primary mining securities have not yet been completed, we thank the SEC for completing figures of the "extractive" industry, under which comes mining, of the primary companies fully registered between July 27, 1933, and June 30, 1937, and sold up to June 30, 1938. These figures were released on June 28, 1939, and promptly sent to me by Baldwin Bane, of the SEC.

These figures tell a doleful story for all new ventures and especially for new mining ventures.

In the extractive industries 191 ventures registered with total registrations of $71,579,000. Of these, 62 with registrations amounting to $20,417,000 did not sell any part of that, while 129 ventures with total registrations of $51,162,000 sold only $12,765,000 of their securities, at a cost of approximately 25 percent of the amount sold. Therefore, the new extractive industries sold only about 17 percent of the total amounts registered and to the public only about 5 percent, the other 12 percent going to private individuals and groups.

I have been given the subject of suggesting how to change such conditions so as to make capital again flow freely into primary mining ventures. The subject is a most difficult one, almost without precedents on which to make recommendations. How can we eliminate the so-called "great apprehension as to the future" that is said to be in the minds of investors in all enterprises, more especially primary mining ventures? In regard to primary mine financing, will the "great American pendulum," as usual, swing to one side or the other and never rest in the middle? Or can we make that pendulum rest in the middle and get a breathing spell for primary mine financing?

In my opinion, these problems can be solved only through the concerted actions of the entire mining industry, especially the western metal mining industry.

In trying to find out what is the matter with primary mine financing today and how to remedy it, let us not fool ourselves with the common complaint that the SEC is to blame, or that something else is the chief cause. There are many causes to blame.

The problem before us is similar to a long hurdle race, where the course is rather unique. Our track setup contains three full-sized hurdles, one half a hurdle and one hurdle that may or may not entirely disappear during the race. The hurdles represent obstacles in our way for which we are not responsible in most cases. After the hurdles are jumped, there is no smooth straightaway to the finish, but rather a rough, irregular track, for which we in the metal mining industry are in a measure responsible and which we can strive to make into a smooth straightaway.

Hurdle 1—Taxes

Concerns federal, state and other taxes to which the mineral industry is subject and to which prospective investors in primary ventures are subject.

We should by all means use efforts to have maintained in the federal and state setups the 15 percent method of figuring mine depletion for reasons

outlined in various pamphlets distributed by the American Mining Congress.

In the various states taxes on growing but unprofitable primary mining ventures can be lessened, like they are in Canada, until the venture proves profitable. Some such system might even be worked out with present federal taxes. All bodies that have the power to tax the primary mining industries should make sure not to kill the goose that lays the golden egg, or silver egg, lead egg, zinc, copper or other egg, as the case may be.

Hurdle 2—Wagner Act

This is the *half* hurdle mentioned before, and covers the Wagner Act and the little Wagner Acts in the several states. This act does not directly affect most of the smaller mining companies and it never should. We should take concerted steps to see that it does not affect primary mining, although most of us are in favor of collective bargaining, when negotiations are carried on with fairness to all bargainers.

Hurdle 3—Wage Hour Act

The Wages and Hours Act. This certainly is a full sized hurdle to the primary mining ventures, especially those in small camps, distant from the bigger municipalities. In such camps the provisions of this act are highly obnoxious to labor and operator alike. Men work only five days per week, lay around in idleness two days per week, and often indulge in pleasures that make them unfit to resume work, since they cannot even go fishing in most climates during the winter months. Even the camp cooks have to stagger their hours. All of this increases the operating expense and capital outlay of the operator, and lessens the income of the men employed.

We must keep on fighting to get an exemption for small camps, to which we are entitled, especially the camps which produce gold and silver, which are not used in interstate commerce. Under the present laws if anyone ever tried to use gold and silver in any kind of commerce, they would be promptly thrown in the hoosegow, under the Hoarding Act.

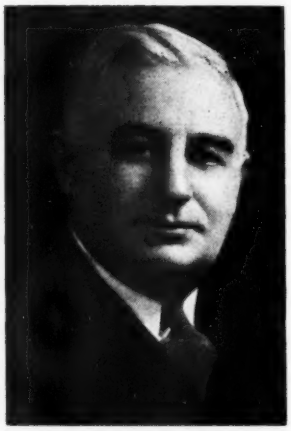
Hurdle 4—RFC Loans

Mining loans from the Reconstruction Finance Corporation.

While we realize that the RFC is more or less of a banking institution, we believe their loan qualifications to mines should be a little more liberal. They have taken greater risks in other industries than they have in the mining industry.

The "Class B" development loan limited to a top of $20,000 is, in many instances, not enough to do the work entailed before an operator may obtain a much larger "Class A" loan. Something should be done to fill the gap between the Class A and Class B loans.

There was a bill introduced into the last regular session of Congress by Congressman Murdock of Arizona, known as H. R. 6131, which called for a separate commission to grant mining development loans of not over $5,000, repayment to come out of royalties from ores, when, as and if extracted and beneficiated. There is a lot of merit in this bill, if its administration could be properly worked out. This bill has the advantage over RFC provisions in that an operator does not have to give the government a first mortgage on his mine or other assets. In a great many cases the operator cannot give a first mortgage, as he does not own the property, but is working it on lease or on lease with right to purchase.



CARL J. TRAUERMAN

If the RFC cannot liberalize its requirements to loan to primary mining companies, Congress can certainly act to do this. We should devote our concerted efforts in obtaining the liberalization asked for to get over this hurdle.

Hurdle 5—SEC Act

The Security Act of 1933 and the Security Exchange Act of 1934, administered by the Securities & Exchange Commission, known as the SEC.

This is the hurdle that I referred to when I stated that it might disappear during the race. There is no question in my mind that, in the long run, for honest promoters, the SEC is a good thing, and to those of us who can live through the "getting used to it" period, it ultimately should prove a real boon to the financing of primary mining ventures.

The SEC laws and regulations have both their good points and their bad points, but, if a few restrictive features are removed, I am of the opinion that the good points far outrank the bad points.

Much has been written and much has been spoken on the SEC, and we could start a discussion, pro and con, on it that would last several days—and probably get us nowhere immediately. Therefore, I will touch on only a few points that materially affect the financing of primary mining ventures.

Unfortunately the original laws were drafted to cover mainly the going companies and commercial lines of new industry. However, since that time, we believe the SEC has tried to make its regulations conform to some of the special problems of the mining industry.

If you come under the $30,000 and $100,000 exemptions, it is not much trouble or expense to qualify, but it is still hard to sell securities after you do qualify. It may not always be an expensive or difficult job to fully register your securities, but even when registered it is difficult to sell securities of a primary mining venture.

There must always be some strictness in qualifying exempted and registered securities. Otherwise the crooks again will creep into the picture and help destroy legitimate promotions, as they have in the past.

The object of this seeming strictness was well defined by Howard N. Lary, Regional Administrator of the SEC at Denver, at the American Mining Congress convention last year in Los Angeles. He stated:

"We, the SEC, want to see an exploration or development project go to the public for necessary funds with success and without suspicion. Registration has but one objective, the full and fair disclosure of all material facts—based on a principle that simple standards of trusteeship demand a high standard of financial morality as the price of confidence."

I have not the time alloted me to go deeply into some of the difficulties of registration, but I am alloted time to show how some of the rules, regulations and other activities of the SEC do bring on great sales resistance for primary mining and other primary securities, no matter how honestly and

completely all present SEC requirements have been complied with.

We believe that the SEC restrictions against public advertising should be modified, as newspapers reach more people than distributors can reach personally, and it is possible that prospective investors may be cheated out of a good enterprise by not knowing that the enterprise was offering securities.

The various states should take action making exempt from their "blue sky" laws any security that is fully registered with the SEC.

The word "underwriter" in the Act of 1933 is a misnomer, according to the common conception of that word, and misleads the public more than it does the issuer. Few primary mining ventures are underwritten. The word should be changed to "distributor."

Legitimate distributors are not interested in primary mining securities today, as they are highly responsible under the Act and too far from the mining property to check up, even if they did have mining knowledge. We asked the SEC for a lessening of the liability of the "underwriter" several years ago, and on March 30, 1938, Chester T. Lane, general counsel of the SEC, wrote me that there was an amendment to the Act of 1933, said amendment being passed in 1934, that did lessen the burden of the "underwriter." I have not the time to quote Mr. Lane's full opinion, but think that the SEC should distribute to brokerage houses and distributors a copy of that opinion, as that may lessen the sales resistance against our securities.

While a prospectus prepared to comply with SEC regulations is mainly a compendium of information, it still is a sales medium, and its arrangement of the necessary facts should be left to the ingenuity of the issuer so long as he tells the truth and includes all the facts required by the Act and SEC regulations. To sell mining stocks it usually is necessary to pay a fairly high commission, a fact which is not generally understood by the prospective investor, even though he realizes that he may make more profits by buying a primary mining stock, on which the distributor receives a large commission, than by buying some other security which is sold with a small commission to the distributor.

Therefore, it is thoroughly bad to have the large commission put on the first page of the prospectus, as the public upon seeing the large commission may throw the prospectus in the waste basket. In short, before the miner has a chance to sell his wares, he must tell what the commission is to be. How do you think merchants would like such a procedure in their department stores?

In regard to the enforcement division of the SEC. We suggest that the SEC go a little more gently with its stop orders. A stop order may not harm a going concern, but is like an injunction when placed against a primary mining venture. No matter whether the company has the stop order lifted or not, the public thinks a stop order means that the company is wilfully crooked. To primary mining ventures coming under SEC jurisdiction I suggest that the companies make their offering date read "When the issue becomes effective," and not set any definite date. That may prevent stop orders against those who want to be honest and give all the facts.

Coming under the Securities Exchange Act of 1934, there is the question of stock market psychology. After the panic of 1906 and 1907, the advance of mining stocks on the exchanges helped to dispel the entire business gloom, and the panic disappeared. The same thing happened at the end of 1914 and in the early twenties. The matter of depressions and prosperity is to a great extent a state of mind and confidence. The mining stock advances on the exchanges helped to finance numbers of primary mining ventures in the years mentioned and some of them are large, highly successful mining companies today.

In the fall of 1936 and early 1937, metals advanced rather sharply and mining stocks again boomed, especially on the smaller exchanges. However, few, if any, primary mining ventures, even SEC qualified, were financed during the 1936-37 boom, except a few illegitimate issues foisted on the public by crooked promoters. The 1936-37 boom was legitimate; but the SEC had distributed lots of questionnaires to brokers asking for their transactions, especially in the mining shares listed on the smaller exchanges. The buying public heard about these questionnaires, immediately became suspicious and again came to the conclusion that investment in mining shares was a hoax and a delusion. When conditions warrant, such as in 1936-37, there is such a thing as legitimate sharp advances in mining shares, without any manipulation, and that fact should be ascertained before the public is scared out of its investments through the passing around of the SEC questionnaires to brokers.

Smoothing Track for Finish

Now that I have told you about some of the hurdles that we should try to eliminate, let's see what can be done to make a straight smooth track for the finish of the race.

We must clean our own house of crookedness, inefficiency and greed, and we can do that by concerted action.

The first mining boom in this country was in 1849, when nearly anyone with luck, could make a fortune with pick, shovel, pan and rocker in the gold fields of California. Since that time, the public notion has been that anyone can manage a mine, and promoters have used the '49 incident to make the public believe that anyone can find and make a mine into a paying venture.

The SEC is a great help in cleaning out the crooked promoters, and we can aid them by concerted efforts in this phase of cleaning our house.

We also can educate the public to the fact that mining is a highly skilled industry and takes men trained in mining technology, mining law and mining business to make successful ventures out of good ore showings. While there are probably few high grade ore bodies undiscovered in this country, there still is the incentive of several relatively recent high grade discoveries to lead our hardy prospectors in their quest for metal deposits.

Most of our present unworked deposits consist of low grade ores, which require mills and the best kind of management. The ore is the only thing on which we should take a chance in a mining venture today as we have standard and tested practices for our mining and milling methods. Good management knows this, and the investing public should be so informed.

Therefore, if our industry knows that certain mining propositions are heading towards failure through rotten management, the investors in that venture should be so informed in time to save their investment. That kind of cooperation within our industry will make it just so much easier to finance new mining ventures.

We still have with us the greedy claim owner and the greedy legitimate promoter, both of whom should be eliminated in order to stimulate primary mine financing. The claim owner may want too much for his claim or he is not willing to offer it for sale on long term payments, as he should in order to get capital. To the

greedy owner we say, "Give the purchaser a chance to see what he can deve'op before asking for any large payments." To the greedy promoter we should state the adage of Wall Street, "There is room here for a bull or a bear but never for a hog."

I am not wholly opposed to purchases of foreign silver, but if we purchase such silver at a price of 40 percent above a natural world price, we should give the nations from whom we purchase the silver a credit for which they can buy only American products at a price above the natural price of our products, just as we buy their silver. The extra profit, or process tax, could be credited to the purchase of domestically produced silver and help maintain that price.

If we do these things for the metals. it wi'l mean higher metal prices and thus help to finance primary mining ventures.

As I have frequently advocated, we should have in the United States Cabinet a Department of Mines, under which could be placed our present highly efficient technical Bureau of Mines and United States Geological Survey. To such a department we could take all of our problems, even primary mine financing, just as the farmers take their problems to the Secretary of Agriculture.

Better Publicity Urged

One of the greatest needs of the metal mining industry, both primary successful ventures, is a public relations unit to give honest publicity to the metal mining industry and the uses of the metals. Concerted efforts should be made to establish this publicity unit for the western states, with branches in each of the mining states to furnish information to the central unit.

The progress of promising mining ventures, rich ore strikes and dividends from mining ventures should be widely publicized by an honest publicity bureau in all the financial centers of this country, not only in mining magazines, with a limited circulation, but in the daily papers where the items will be read by the entire investing pub'ic and the people who use the products of our mines.

Special stories should be written and published on the mining industry. We should give talks on the radio and even send men to make addresses before Chambers of Commerce all over the country, to show people in distant centers that a prosperous mining industry creates a large demand for products such as farm goods, clothing, machinery and supplies which they produce and can sell us. Investors in the financial centers can increase the industries through which they make their livelihood, by helping us finance our primary mining ventures. We can tell them this and tell them that due to the watchful eye of the SEC they will be assured of a fair deal when they do invest in our mines, something we could never honestly tell them before the SEC was created, and for which we all owe a debt to those who created and now administer the SEC.

The late George Hearst, who made most of his large fortune in mining once said, "If you will go into mining with the same good judgment you would use to succeed in any other line of business, you will make more money in mining than in any other line of endeavor."

We also should widely publicize meetings like this one in Salt Lake and meetings of our state and other national mining associations, so as to obtain the strength and prestige to get rid of the hurdles that I mentioned earlier in my talk. Nearly all prestige, especially that prestige necessary in combating obstructive legislation, comes from publicized strength. Our associations carry a lot of prestige now, but let's leave nothing unturned to create more prestige.

If we all pull together along the lines suggested, some day when the sun sets in the west, society will again restore the initiative and courage of the pioneer mining man, and he can say with confidence, "I have raised the money to prove up and take out at a profit the 'gold in them thar hills'."

Inspection and Maintenance of Mine Hoisting Ropes

The inspection and maintenance of mine hoisting ropes, a matter of great practical importance to thousands of mines in the United States, is the subject of a technical paper recently published by the Bureau of Mines, Department of the Interior.

A brief historical note traces the development of modern practice in the manufacture and use of wire rope. The paper also contains a discussion on the characteristics of several types of rope construction.

Safety factors, including the minimum factor for new rope and the minimum factor when rope must be discarded, are tabulated for various depths of shafts, and other safety precautions are reviewed.

Specific instructions are given for the handling and storage of rope, and for the mounting of a new rope on the drum of the hoist. Both the socket method and the clip method of attaching ropes are described and their comparative advantages are discussed.

The satisfactory installation of a hoisting rope requires due consideration for the layout and design of sheaves and drums. Tolerances and methods of maintenance are given for grooves in sheaves and drums. Tests by rope manufacturers have shown that sheaves at least 90 times the diameter of the rope are required to prevent excessive fatiguing of the rope.

Hoisting ropes are subject to three kinds of deterioration—namely, abrasion, corrosion and fatigue. Broken wires are warning signals that a dangerous condition of the rope is approaching. Any sudden marked decrease in the diameter of a rope is cause for its immediate removal.

The proper lubrication of a rope begins with its fabrication at the factory. This includes impregnating the hemp core, covering each wire with a protective film and introducing lubricant in the strands by pressure methods. Three methods of field lubrication are described—the two-step method, the drip method, and the cold climate method.

The inspection of a rope should determine the deterioration due to abrasion or wear, broken wires and corrosion; the latter is the most difficult defect to detect. Whenever a section is cut from the lower end of the rope, it should be taken apart for complete inspection. This section may afford an indication of the deterioration due to corrosion in the remainder of the rope.

Regulations for maintenance and inspection of hoisting rope are abstracted from rules promulgated by four different mining companies. They emphasize the importance which mine management places on this phase of safety.

The new Pan American Airway's *Yankee Clipper* weighs over 40 tons, is 106 feet long and has a wing span of 152 feet. Built by the Boeing Aircraft Company, the trans-Atlantic giant can carry 74 passengers by day and 40 at night, in addition to 10,000 pounds of cargo. There are over six miles of copper wire in the plane, and much beryllium copper is used in the instruments. There is a total of 320 pounds of copper and its alloys performing useful and vital service on each of the Clipper ships.

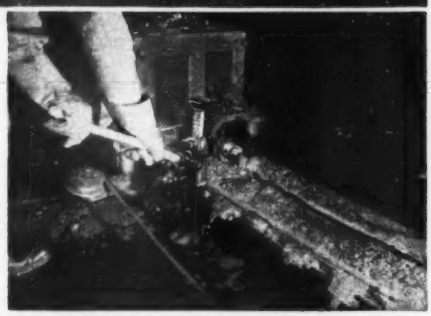
The world's annual rust bill is between three and four billions of dollars. Corrosion-resistant copper and its many alloys have combated the ravages of metal-devouring rust for many centuries.

Safety is Inexpensive – with Simplex Mine Jacks!

Simplex Mine Jacks are so ruggedly constructed, so long-lasting, safe and easy to operate that it does not pay to be without them, especially since they cost so little.

It's the exclusive Simplex safety features—awarded the only Gold Medal Award for Safety — that keep coal coming to the top. Avert accidents and prevent life and property losses by using Simplex Jacks.

Only Simplex Jacks will lift and hold their full rated capacity on cap or toe. There's a Simplex Mine Jack for every purpose—for coal cutting and loading machines, rerailing mine cars and locomotives, cross timbering, roof supports, post pulling, cable tensioning, wheel pulling and other jacks for mining and maintenance purposes.



Top: Cross timbering is safe, economical, with Simplex Timber Jacks. Greater Strength adjustable Mine Roof Jacks. Two new models that are 50% stronger, M-8—8 tons capacity; and M-16—16 tons capacity—now available, made in 8 sizes. Bottom: 85-A readily lifts coal cutters and other heavy equipment. Profitably operated mines everywhere use Simplex Jacks.

TEMPLETON, KENLY & CO.
Chicago, Ill.

Better, Safer Mine Jacks Since 1899

See Us at Booths 208 and 210 at Cincinnati.

SIMPLEX Jacks
Awarded the Gold Medal for Safety

Send For Simplex Bulletin
Mines—39

WHEELS of Government

● *As Viewed by A. W. Dickinson of the American Mining Congress*

MORE than half of the last session of the 76th Congress has passed, and the Senate and House leaders, reflecting the desire of the Administration, are still crowding for an early adjournment, although the original objective of May 15 as the closing date can hardly be expected now and the time of adjournment will probably extend into early June. The Hatch anti-political pernicious activities bill has, up to the present time, been the chief source of delay, and the three weeks devoted to the Foreign Trade Agreements authority extension has caused the Senate to lag behind in its work, even though that body has been convening at 11 o'clock in the morning and carrying through some of the sessions until 6 and 7 in the evening. Also lying ahead on the Senate calendar are the anti-lynching and relief bills, which carry with them possibilities of prolonged discussion and delay.

Taxation—Coal Legislation

Although as the weeks pass there is less and less probability of a general revenue bill, the approval by the Senate of the $300,000,000 agricultural subsidies, together with the campaign war chest relief bill which will undoubtedly be passed before adjournment, brings the thought, at least, of the possible enactment of an overriding tax applying on income taxes of individuals and corporations. It is generally believed, however, that no matter how unbalanced the budget may become, raising of additional revenues or hiking of the $45 billion debt limit will be deferred to the next session.

Representative Robert Allen, of Pennsylvania, expects the Ways and Means Subcommittee under Chairman Jere Cooper, of Tennessee, to begin hearings on his bill to amend the Guffey Coal Act in the near future. His amendments call for the repeal of the 1c per ton administrative tax which has already taken more than $11,000,000 from the country's coal producers, removal of the 19½ percent punitive tax against non-conformists, abolition of price-fixing provisions, and the liberalizing of the sales agency features of the present Act. The vote of 88 to 74 on March 7 in the House of Representatives whereby $1,000,000 was cut from the Bituminous Coal Division appropriation was a clear demonstration of the feeling which exists in the lower house towards the whole situation. This $1,000,000 cut is now under consideration in the Senate Appropriations Subcommittee (Senator Carl Hayden, of Arizona, chairman), and it will be interesting to see not only the sentiment of the Senate Appropriations Committee but also the action which will follow when the Interior bill comes out on the Senate floor.

Interior Secretary Ickes' Bituminous Coal Division has recently announced its findings as to minimum prices for the Rocky Mountain coal mining and marketing areas, and it is stated that the Division expects to make an early announcement of the prices for the balance of production in the United States. Including the time which will be allowed for presentation of opposition to these prices before the Bituminous Coal Division and later before the Secretary of the Interior, it is estimated that it may be possible to put them into effect some time around the first of September, although the exact time is a matter of uncertainty because of possible court action which may ensue.

In this connection it is interesting to note that the Supreme Court has agreed to hear the case of the Sunshine Anthracite Company of Arkansas, in which the constitutionality of the Act is challenged, particularly the validity of the 19½ percent penalty tax provision. Observers believe that the Supreme Court, as it existed before the recent appointment, would declare the taxing provisions of the Guffey Act unconstitutional. They believe that the precedents set in the invalidation of the first Guffey Act, the NRA decision in the Schecter case, and the court finding against the processing tax section of the Agricultural Adjustment Act are sufficient to kill the present Guffey Act, unless the court as now constituted reverses the entire philosophy of these earlier decisions.

The Supreme Court may hand down its decision by the end of April, and in the meantime it is known that majority party leaders are considering with concern the reactions of the public in the northern states toward increases in coal prices which are expected to follow the final pronouncement by the Bituminous Coal Division. Political advisers of the majority party are not unaware of the fact that the fuel consumers of the northern states have just passed through a hard winter, and hence are more conscious of the cost of heating their homes than has been the case for several years past.

Ickes' desired Federal Coal Mine Inspection Bill, S. 2420, authored by Senator Neely, of West Virginia, has been considered by the House Mines and Mining Subcommittee under the chairmanship of Representative Andrew Somers, of New York, and the committee is securing the views of the Governors and Mine Inspection Departments of the coal-producing states. Four of the five members of the subcommittee proceeded during March to the scene of a coal mine explosion in Ohio, where they held an investigation at the mine and heard the statements of mine officials and workmen who were intimately familiar with the details of inspection and safety precautions at the property. Representative Somers' committee has taken no definite action on its future procedure.

Foreign Trade Agreements

Floor consideration of the resolution extending the Reciprocal Foreign Trade Agreements authority consumed the last week in March and the first week in April. Reported to the Senate floor by the Finance Committee in the same form in which it had passed the House, the bill was the subject of an earnest attempt on the part of Senator Pittman, of Nevada, to force the addition of an amendment which would have required Senate ratification, by a two-thirds vote, of all future trade treaties. When, after a week's debate, the amendment was put to a vote, it was defeated under Administration pressure by a vote of 44 to 41. The next move by Senator Pat McCarran, of Nevada, to attach an amendment removing the import excise taxes on oil, coal, copper and lumber from the consideration of the State Department negotiators, was defeated by the wider margin of 45 to 36. Senator O'Mahoney, of Wyoming, who has been doing yeoman service in attempting to restore Senate control over the foreign trade treaty power, is battling for his amendment which would require majority approval of both the House and Senate before the trade agreements could become effective. After the defeat of the Pittman amendment, however, observers for the most part believe that the foreign trade agreements power given to the Administration by the Congress in 1934 will be continued without any material qualification.

Silver

In connection with its foreign policy the Administration through Secretary of the Treasury Morgenthau registered objection during March to the Townsend bill, S. 785, which in the form reported to the Senate by the Committee on Banking and Currency would discontinue the purchase of foreign silver. Secretary Morgenthau desires to continue such purchases because of the existing situation with reference to Mexico and other Latin American countries as well as with China.

The original Townsend bill as introduced and sent to the Banking and Currency Committee went beyond the prohibition of foreign silver purchases and included the discontinuance of the power given the President in the original Thomas amendments to the AAA Act and in the Monetary Act of 1939 for the acquisition of domestically mined silver. This matter was brought to the attention of the Committee on Banking and Currency by a forceful statement from the American Mining Congress, which said in part:

"The monetary Act approved July 6, 1939, is of the highest importance to the entire nonferrous metal mining industry of the western states and to the hundreds of thousands who are dependent upon it for a livelihood. Practically all of the mines in that area produce substantial amounts of silver, and the income therefrom is an important factor in making it possible for them to operate and give employment at satisfactory wages. The action of Congress last summer, for the first time in many years, stabilized the rate at which the Treasury would accept domestically mined silver and gave some degree of assurance for the future."

The American Mining Congress further told the committee that to modify or abrogate the policies adopted by Congress would be unjust to domestic producers who had relied upon published statements that the pending legislation related solely to foreign silver.

National Labor Relations Board

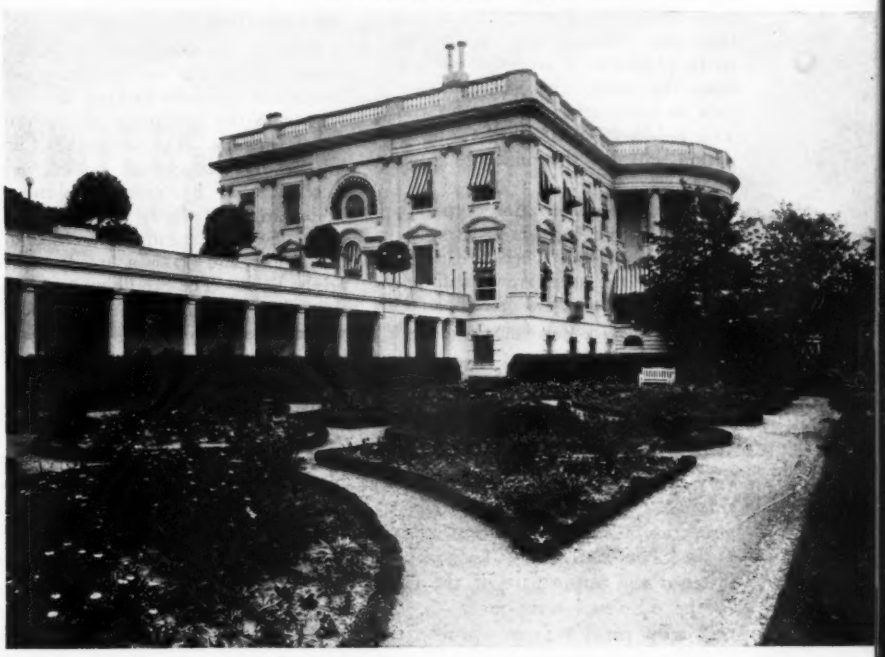
During March, Chairman Mary Norton of the House Labor Committee considered the recommendations of the Howard W. Smith Investigating Committee and has proposed four major amendments to the National Labor Relations Act, which would (1) increase the board from three to five members, (2) permit employers to petition for election, (3) give craft units or small units separate bargaining representation if desired, and (4) provide one-year life for contracts entered into by certified bargaining representatives and an employer. What congressional action can be had on the proposed amendments, as well as on other amendments which may be offered from the floor, is as yet an open question, but it is believed that Administration forces will not seriously resist a program of moderate and much-needed amendments to the Act.

Wage-Hour

Feeling at the Capitol toward the Wage-Hour Act and its administration was evident this month in the action of the Appropriations Committee of the House in cutting $1,035,000 from the Wage-Hour Division's original total of $6,185,000. On the floor of the House, Representative Casey of Massachusetts tried to restore the full budget figure by an amendment which was rejected by a vote of 148 to 115.

There has as yet been no action on the Norton-Ramspeck-Barden amendments to the Fair Labor Standards Act, but it is known that many House members are losing patience with the idea of giving Wage-Hour Administrator Fleming further time to endeavor to solve the problem through administrative action; and it is anticipated that some member of the Committee on Rules will bring up the amendments in the near future and will press for action. Chairman Elbert Thomas (Utah) of the Senate Committee on Education and Labor has

The beautiful gardens in back of the White House have fully recovered from the Easter egg-rolling crowds



appointed a subcommittee to consider proposed amendments to the Wage-Hour Act, the personnel consisting of Senator Pepper of Florida, chairman; and Senators Holt (W. Va.), Ellender (Louisiana), Bridges (N. H.) and Taft (Ohio).

On April 2, in response to representations made to the Exemptions Section, Wage-Hour Division, by the American Mining Congress and the Colorado Mining Association, a seasonal exemption was granted to gold placer operators in the State of Colorado which will permit a 56-hour work week without payment of overtime for any 14 weeks in a year. This seasonal exemption is supplemental to that granted previously to gold placer operators in Alaska, Washington, Oregon, Idaho, Utah, Montana, Wyoming, and South Dakota.

Stream Pollution

Since the Barkley-Mansfield Stream Pollution bill passed the House and was sent to conference early in March, representatives of mining and other industries from the Pacific to the Atlantic have registered strongly with their congressional delegations against the harmful Mundt amendments which were placed in the bill when it was under consideration on the House floor. It will be remembered that these amendments prohibit the discharge of any "new sources of pollution" either by sewage or industrial waste; declare such pollution to be against the public policy of the United States and to be a public and common nuisance; and provide that an action to prevent or abate any such nuisance may be brought in the name of the United States by any United States attorney. The Senate and House conferees are not expected to meet before the middle of April, at which time it will be necessary for the three Senators in the conference, i. e., Barkley of Kentucky, Sheppard of Texas, and McNary of Oregon, to press aggressively and consistently upon the House conferees for the removal of the Mundt amendments in their entirety.

Reorganization

Presidential Reorganization Order Number 3 was finally sent to the Capitol on April 2, with no provision for transfer of the Forest Service functions to the Interior Department. A final attempt was made by Interior Secretary Ickes on March 28 to secure the transfer to his Department of supervision of (1) recreational areas in the national forests, (2) 17,000,000 acres of forest grazing area and (3) 35,000,000 acres of wilderness area (on which road building is forbidden). Fortunately, as the result of an immediate barrage of protests, the attempted new insertion in the presidential reorganization order was withdrawn, and it is greatly to be hoped that this marks the end of the effort this year by the Department of the Interior to raid the very proper and satisfactorily administered function of the Forest Service.

Coal Mine Illumination

(*Continued from page* 61)

owners refused to expend money for underground construction necessary for ventilation and depended on the safety lamp too much for protection against gas. This thought caused some resistance to the introduction of safety lamps in many mines. Also, the safety lamp was a clumsy appliance and had to be placed at a safe distance away from the miner who was swinging a pick or using other tools of his trade. This reduced the already little illumination afforded the miner by such a light.

But as mines were sunk deeper they practically all generated explosive gases in quantity. Therefore, the use of the safety lamp grew; and practical suggestions were offered, and in most cases accepted, for its improvements.

Metal or tin shields were added to the Davy, and sometimes it was put into a metal cylinder with a pane of glass in it, when the lamp was carried very much, as by officials traveling through the mine on their tours of inspection. Such a lamp was known as the "Tin Can Davy." Locks which fastened the upper part of the lamp to the oil vessel were made to stop foolhardy persons from opening the lamp in dangerous atmospheres. Lamps of the Clanny type were improved by the addition of metal cylinders (bonnets) enclosing and protecting the upper part of the lamp. New lamps with double gauzes were made. These all followed the pattern of the original Clanny lamp. In fact, today our most modern safety lamps are only very much improved patterns of the lamp invented by the mine doctor of Sunderland—Dr. Clanny.

With all the improvements made on safety lamps, the use of the candle continued. Candle making became a science in the beginning of the nineteenth century. The action of a burning candle was closely studied, with a result that by proper design and better material used, the candle lost most of its sputtering, smokiness and bad odor, and gave a steady, fairly bright light. The candle was a flexible system of illumination. It could be carried in the hand by itself or placed in a crude lantern. For use in working faces the candle was put into a lump of damp or wet clay. The clay lump could be stuck on the coal face, on a timber, or any other convenient place where the candle would give the miner the most light. Clay lumps were used in English coal mines until the beginning of the present century. Then metal holders were devised to meet the requirements of a law passed in 1911, which provided that candles be placed in a holder so that the candle flame could not set fire to a prop.

The Scotch coal miner of the nineteenth century preferred the oil lamp to the candle. He also favored a small lamp so constructed that it could be readily attached to his cap or hat.

(*To be concluded in the May issue.*)

On Selecting a Crusher

(*Continued from page* 68)

high as compared to other crushers of similar size or weight. They are capable of producing a fine product, especially when fitted with non-choking jaw plates. At the finest nominal setting of ¼ in. this crusher will produce a product averaging 50 percent minus ¼ in. and 85 to 90 percent minus ⅝ in.

The most economical selection of any particular crusher is a function of its ability to handle maximum size of feed, reducing this at the highest possible ratio of reduction at a minimum expenditure for original installation, maintenance and power. Where most of the feed is coarse, and stage crushing is required, primary crushers with straight crushing surfaces should be used. Conversely, where only a small percentage of feed approaches the size of the crusher opening, non-choking crushing surfaces should be used.

MILES OF SMILES FOR USERS OF TIMKEN BEARING EQUIPPED MINE CARS

From every point of the compass reports of outstanding performance by Timken Bearing Equipped mine cars constantly are coming in. They have been coming in for the past 19 years—ever since the first mine cars went on TIMKEN Roller Bearings. During the intervening period the total number of Timken Bearing Equipped mine cars has risen to more than 272,000. That represents 2,176,000 bearings. An overwhelming majority of these bearings still are on the job.

TIMKEN Bearings are dominant in mine cars because, besides having unexcelled smoothness, they stand up under the slam bang conditions of mine car service better than any other anti-friction bearings ever used in mine cars.

Behind every TIMKEN Bearing that goes in a mine car are the full research, engineering, manufacturing, testing and financial resources of one of the world's greatest industrial institutions. The mine operator can't lose—he *must* be satisfied, come what may.

Any mine car manufacturer can furnish cars equipped with TIMKEN Bearings. Be sure to specify and insist on them in the new cars you buy.

THE TIMKEN ROLLER BEARING COMPANY, CANTON, OHIO

NEWS and VIEWS

Coal Division Discusses Regional Marketing Agencies

The Bituminous Coal Division of the Department of the Interior proposes to "deal cautiously" with regional marketing agencies for the sale of bituminous coal, according to its third annual report.

The agencies are formed voluntarily by combines of coal companies in the various producing fields, who enter individually into contracts with the agency to sell their coal at a price fixed by the agency. Some of the agencies levy penalties for sales below these fixed prices. In one case the agency seeks to control the amount of coal each member may produce as well as the price.

The Division stated that while it recognized the possibility that such agencies might develop into a useful adjunct to the Coal Act, it also realized that "without careful administration and supervision, based upon actual experience, these agencies may be a useless expense upon the industry or prejudicial to nonmembers or to the proper interests of consumers."

The report deals generally with the establishment of minimum prices for bituminous coal and other activities in administration of the Bituminous Coal Act.

The Coal Act provides for the operation of marketing agencies outside the control of the anti-trust laws, but subject to the approval and regulation in the public interest by the Division. Both the agencies and their members must observe the minimum prices and the rules as established by the Division.

The Division's report said: ". . . there had been insufficient experience with marketing agencies in the industry to permit any reliable judgment as to their value or proper scope." The agencies organized to date include only a minute proportion of the producers, although the companies in them produce almost one-fifth of the national tonnage.

"Due to the inactivity of many of these agencies and the short time that most of them have been operating, it has not been deemed practicable or necessary to adopt regulations to govern their activities, as contemplated by section 12 of the Act. The Division, however, has begun a study of their operations with a view towards improved administration of section 12, and to ascertain whether and to what extent they can be made helpful to the industry, while, at the same time, protecting the interests of consumers and dealing fairly and impartially with all producers."

Ten of the agencies applying had been approved for operation, and the remainder were pending when the report was compiled. Some of these have never engaged in the marketing or sale of coal; some have attempted to fix selling prices and some have been comparatively inactive. Seven of them were approved during 1937 and 1938, although only three commenced operation prior to January 1, 1939, and have shown any experience over a period of time. They are Appalachian Coals, Inc., Cincinnati; Alabama Coals, Inc., Birmingham; and Smokeless Coal Corp., New York.

The other agencies which have received temporary approval are:

Arkansas-Oklahoma Smokeless Coals, Inc., Fort Smith; Kentucky Coal Agency, Inc., Madisonville, Ky.; Middle States Fuels, Inc., Terre Haute, Ind.; Southern Illinois Coals, Inc., Chicago, Ill.; Southwest Coal Co., Kansas City, Mo.; Upper Buchanan Smokeless Coals, Inc., Columbus, Ohio; and Western Pennsylvania Coal Corp., Pittsburgh, Pa. In addition to these, Fairmont Coals, Inc., Fairmont, W. Va., was approved, but never started to operate.

Applications of the following had been heard, but were pending disposition at the time the report was compiled:

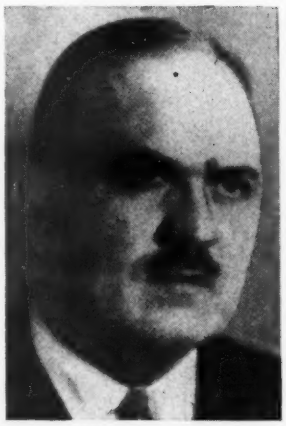
J. H. Weaver & Co., Philadelphia, Pa.; Iowa Coals, Inc., Des Moines, Iowa; Empire Coal Co., Des Moines, Iowa; and Brazil Block Fuels, Inc., Terre Haute, Ind.

The application of Belleville Fuels, Inc., Chicago, Ill., has been approved since the annual report was compiled.

METAL MINING CONVENTION AND EXPOSITION

Colorado Springs, September 16-19

Arrangements for the 7th Annual Metal Mining Convention and Exposition got under way with the announcement that Merrill E. Shoup, President of the Golden Cycle Corporation, prominent mining man of Colorado Springs, has been elected chairman of the Board of Governors of the Mining Congress' Western Division. Mr. Shoup succeeds D. D. Moffat, Vice President, Utah Copper Co., Salt Lake City.



MERRILL E. SHOUP

The Convention and Exposition will be held September 16-19 at the Broadmoor Hotel, Colorado Springs. Under Mr. Shoup's direction a nationwide program committee will shortly be appointed to work up a convention program covering the vital economic, legislative, tax and operating problems of the industry, together with arrangements committees who will make plans to insure the comfort and enjoyment of all convention visitors.

The ascending importance of these annual meetings in the affairs of the metal mining year is shown by the attendance of executives and operating men, from both large and small companies, representing the great bulk of the country's production of metals. The return to Colorado has met with unanimous approval of western mining men, and a record turnout is assured.

Watch the Mining Congress Journal for further details!

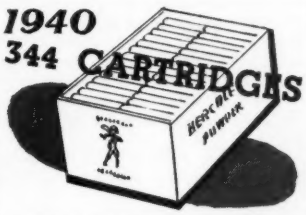
Youngman Closes Tailings Plant

The tailings plant of Youngman Milling Company, located north of Picher, Okla., was closed late in March for an indefinite period. About 30 men were employed at the plant, which started re-treating tailings from the north tailing pile on the old Evans-Wallower No. 24 lease the latter part of last November.

SOLVING The Mystery of the EXTRA 74 CARTRIDGES!

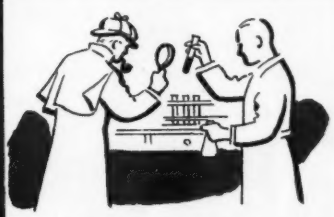
AN EXAMPLE OF EXPLOSIVES PROGRESS

1. IN 1920, 100 lbs. of permissibles averaged 270 cartridges. Coal mining operators demanding better prepared sizes needed higher-count permissibles.



2. TODAY, there are 344 cartridges in 100 lbs. of average permissible—each cartridge doing its job with added efficiency and economy.

3. LET'S PICK UP the trail of the *extra* 74 cartridges and find out where they came from.



4. OUR FIRST logical stop is the Hercules research laboratory. Here, we get our first look at pioneering in higher-count permissibles.

5. NEXT, LET'S VISIT the mines. Here, each new Hercules high-count permissible, tested under actual field conditions, proved helpful in producing prepared sizes.

6. LET'S INTERVIEW the preparation engineer. He says: "Better lump, more production, cleaner coal, added safety with these new modern permissibles."

7. NOW TO THE MINE bookkeeper. He says: "Modern Hercules permissibles give more lump to ship and powder cost is less."

8. THE MYSTERY is solved. The *extra* 74 cartridges result from Hercules' fixed policy of producing better and more economical explosives

REMEMBER.... THESE FIGURES ARE AVERAGES. Hercules Permissibles cover the full range from 200 to 500 cartridges per 100 lbs.

B-50

HERCULES POWDER COMPANY
Incorporated

WILMINGTON, DELAWARE

Expect Record Copper Consumption For Water Lines in 1940 Houses

With every indication pointing to a building boom this year that will even eclipse that of 1939 when, according to the Department of Commerce figures, more than $10,000,000,000 was spent in that field, the consumption of brass pipe and copper tube for water lines will unquestionably establish a new all-time tonnage record, according to a recent statement by Bertram B. Caddle, secretary, Copper & Brass Research Association. Last year there was more brass pipe and copper tube sold for water lines than any year in the history of the industry.

There was also a large increase in the use of copper tube, particularly in air conditioning, mechanical refrigeration, and in streamline railway cars. As a matter of fact, new all-time consumption records in these three industries was broken. Associations and manufacturers in these fields prophesy that there will be more units built this year than last which, of course, will mean increased consumption of the red metal.

A new field is being successfully developed for the use of copper tube. This is for irrigation and sprinkling systems. Copper tube is being largely used for irrigation in agricultural and fruit centers throughout the country, while it is also being used for lawn sprinkling by private homes and cemeteries. Another field for the use of this material, increasing rapidly, is in the manufacture of copper convectors for heating and other types of radiation.

Projects of Federal Housing Administration and the United States Housing Authority last year used millions of pounds of brass pipe and copper tube for water lines, and, with the administrators of these two departments predicting an increased volume of construction this year, the 1939 tonnage should be exceeded.

Another governmental agency that is using large tonnages of brass pipe and copper tube is the Home Owners' Loan Corporation. That governmental organization, which is today perhaps the largest property owner in the country, is replacing worn out, clogged pipe with copper tube to have the houses modernized for resale.

Toward Minimizing Blasting-Cap Injuries to Children

Each year there are numbers of children under the age of 16, who are injured, and in some instances killed, from playing with blasting caps.

These accidents have been a matter of great concern to companies manufacturing commercial explosives, and for many years numbers of these companies carried on campaigns of warning against such accidents.

In 1926 the Institute of Makers of Explosives, a trade association comprising manufacturers of commercial explosives, took the matter up and began a vigorous movement to arouse public sentiment in the hope that parents, teachers, and all others who had children in their care, would cooperate in safeguarding boys and girls by instructing them concerning the dangers of playing with blasting caps.

Warnings against allowing these blasting caps to fall into the hands of children had for years been given to all purchasers of such blasting accessories. Increased efforts along this line were made in 1926, and new literature placed in each box of caps, together with the wording on the boxes containing the caps, specifically called attention to the dangers. These efforts have been continued each year.

Reports show that the most common types of accidents are from striking the caps with a hammer or stone. Any blasting cap will explode if it is hit hard enough with such instruments. Accidents are caused in large measure also by holding lighted matches to the caps. Picking out the explosive with a pin or nail also causes many injuries.

The movement to prevent accidents to children from playing with blasting caps is an attempt to completely avoid such accidents and to save boys and girls for useful work in later life.

Most of the accidents occur in rural districts or in the suburbs of the larger cities.

Children and others inexperienced with explosives should not touch a blasting cap. It should be allowed to remain where found until an officer of the law or other responsible adult can be located.

Your cooperation is urged in this worthy campaign to lessen possible danger to thousands of children in mining camps throughout the country.

Boats Wanted for Coal Exports

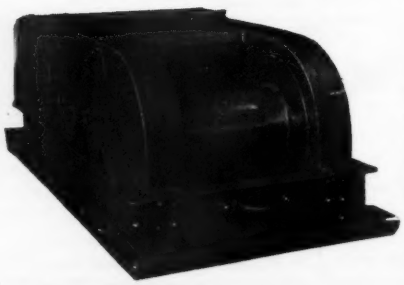
The soft coal industry appealed to Congress for ships early in April so it can get a bigger share of the emergency market created by Europe's urgent needs.

Officials of the Coal Exporters Association estimated that the United States could boost its coal export trade 50 percent if the Maritime Commission were authorized to recondition more than 100 old government boats, now rotting at anchor.

Bituminous coal exports to European countries whose normal sources of supply have been disrupted by the war, totaled 91,843 tons in February, and are estimated at approximately 200,000 tons for March, according to the Coal Exporters Association.

This is three times the normal prewar rate and was achieved despite tremendous transportation costs and shortage of boats.

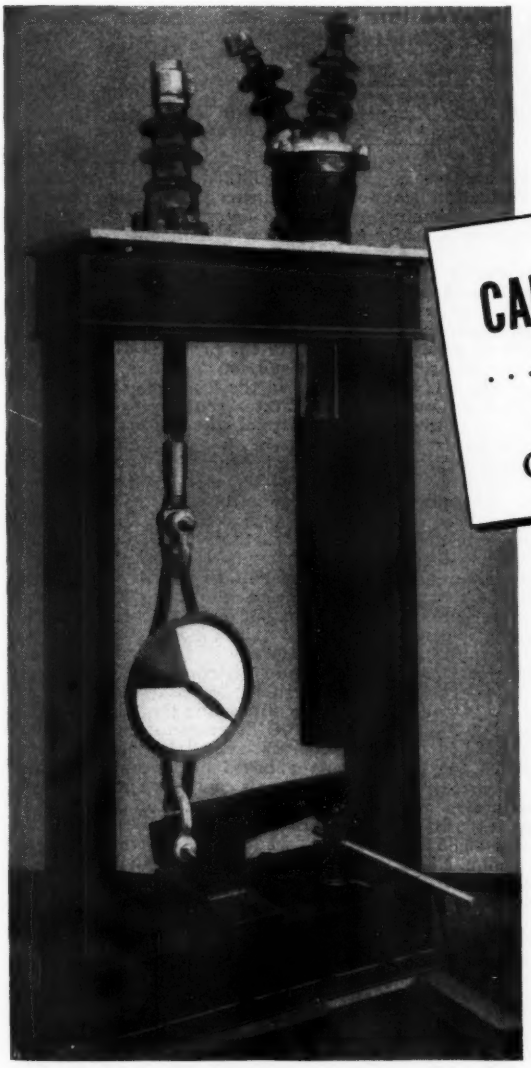
Italy, faced with a serious shortage because of the British blockade of



MODEL HKL CAR SPOTTING HOIST

● This model of the famous "Brownie" line of car spotting hoists was designed for moving trips (of the size usually hauled by 10 to 12 ton locomotives) at conveyor loading points in very low coal. Having an overall height of only 24 inches—and a sled type base with posting seats—this machine keeps handling costs down!

THE BROWN-FAYRO COMPANY
940 ASH ST. JOHNSTOWN, PA.



CALLING ALL MINE OPERATORS

. . . to the American Mining Congress Exposition – held in Music Hall Cincinnati, Ohio, April 29 – May 3

This Bore Hole Suspension Unit *will feature the* Anaconda Exhibit

MINE operators will find it both interesting and profitable to attend the American Mining Congress Exposition this spring. At this convention it is expected that more new equipment will be displayed than in many years.

The Anaconda Wire & Cable Company will show you the Bore Hole Suspension Unit featured on this page. Anaconda engineers will be on duty at our Booth (No. 820). They will not only demonstrate this Suspension Unit... but other Anaconda developments in mining machine cables.

Read about the advantages of the Anaconda Wire & Cable Company's Bore Hole Suspension Unit! Then come and see it! A visit to this convention will be well worth your while. 8906b

ANACONDA
from mine to consumer

Advantages Offered by Anaconda's Bore Hole Suspension Unit

1 Cable and Suspension Unit completely assembled.
2 Costs far less to install.
3 Neat and compact.
4 Requires less supporting framework.
5 Cable weight is reduced by 50%.
6 Terminates, seals and suspends the cable.

USE MODERN IMPROVED *Anaconda Wire & Cable*

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German exports, bought 18,954 tons of United States coal in January, despite total shipping charges of $20.10 per ton from West Virginia mines to Italian ports. The coal itself sold for about $2 per ton. It was reported in March that the Pond Creek Pocahontas Coal Co. was loading 20,000 tons of coal at Norfolk, Va., for the Italian government, following a previous shipment of 10,000 tons.

United States exports of bituminous coal to all countries totaled approximately 512,390 tons in February. Canada, a regular customer, took 290,457 tons. Other January purchasers were Brazil, 62,404 tons; Argentina, 49,501 tons; Cuba, 26,006 tons; Sweden, 19,611 tons; Jamaica, 11,864 tons; and Canal Zone, 11,110 tons.

It was reported that coal is retailing in some Scandinavian towns for as high as $25 per ton.

Fuel Engineering Conference

The Twenty-fifth Fuel Engineering Conference of Appalachian Coals, Inc., will be held jointly with the Fourth Annual Coal Utilization Institute of the University of Michigan at Ann Arbor, April 22, 1940.

The program for the meeting is carefully designed to cover a broad scope in coal utilization, and to appeal to industrial executives, power engineers, purchasing agents, coal distributors, and equipment manufacturers, as well as research men, educators, fuel engineers and engineering students.

Big Sandy-Elkhorn Officers

Newly elected officers of the Big Sandy-Elkhorn Coal Mining Institute include: W. R. Campbell, general foreman, Koppers Coal Company, Weeksbury, Ky., president; A. D. Sisk, Big Sandy-Elkhorn Coal Operators Assn., Pikesville, Ky., safety director; F. M. Correll, safety inspector, Consolidated Coal Company, Jenkins, Ky., first vice president; M. K. Reed, general foreman, Turner Elkhorn Coal Company, Drift, Ky., second vice president; and W. E. Hess, superintendent, Elkhorn Coal Corporation, Wayland, Ky., third vice president.

Directors of the organization are as follows: G. C. Sutherland, V. D. Picklesimer, Estill Cox, B. H. Purser, Herbert Wheeler, J. H. Claggett, J. T. Parker, Harvey Maynard, J. D. Snyder, D. T. Lucas, A. J. Mandt, and J. E. Green.

Safety awards presented at the annual meeting held in Pikeville to foremen who did not have any lost-time accident occurring to men under their jurisdiction were given to W. H. Collins, A. E. Corder, G. A. Hixson, I. E. Shelby, R. B. Porter, Deb Hall, W. R. Campbell, R. C. Collier, and Henry Vanover. Bronze plaques were awarded the Consolidation Coal Company, Elk Horn Coal Corporation, and Koppers Coal Company.

Bituminous Prices for Western Area Filed; Eastern Scales Expected Shortly

• *Supreme Court Accepts Guffey Act Test Case*

For the second time in three years the New Deal Administration is struggling to make effective minimum prices for the bituminous coal industry.

Examiners of the Bituminous Coal Division of the Interior Department have filed a schedule of minimum prices for the Rocky Mountain and Pacific Coast states, which in general approximate the actual average prices at which bituminous coal was sold at Rocky Mountain and Pacific Coast mines during 1939. Division officials expressed the opinion that they expect final approval of this schedule, with minor changes, within a few weeks.

The report, filed by Examiners Lewis, Fowler, and Jaffee, pointed out that due consideration had been given to competition of other forms of fuel and energy, as well as the differences in transportation methods and charges and their effect between producers.

Examples of the minimum prices proposed by the schedule as applicable to rail shipments to certain coal markets follows:

Prices for shipments to Denver, Colo.: District 16 prices for 2½-in. domestic lump range from $4.40 for the Louisville coals to $3.20 for the Jefferson coals. District 17 prices for 3-in. lump for this destination are $4.10 for the Walsenburg, Oak Hills, and Canon No. 1 coals and $3.85 for the Mount Harris and Canon No. 2 coals. District 17 prices for 1½-in. slack from Mount Harris, Oak Hills, and Walsenburg are $1.70, and District 16 prices for that size are $1.80.

Prices for shipment to Salt Lake City, Utah: District 20, 3-in. lump, $3.65 for Castlegate coals; 1-in. slack ranges in price from $1.45 for sub-Districts 2 and 3 to $1.75 for sub-District 1 coals.

Coal Division officials claimed that a large percentage of these prices are those agreed upon by the district producer's boards for the western area. Before these first price recommendations are promulgated by Director Gray there will be hearings on producer exceptions to the recommendations. Then the Secretary of the Interior will look them over before final announcement.

Following the release of the western schedule the trial examiners went to work getting into final shape their recommendations for minimum prices for the other producing areas. As the JOURNAL went to press, their preliminary price report was announced.

Adoption of the proposed schedule will be the second time in the three-year life of the latest Coal Act that minimum prices have been officially announced. Late in December, 1937, the then Bituminous Coal Commission promulgated a minimum price schedule and announced marketing rules and regulations, but intense opposition from certain sections of the country, coupled with an adverse court decision, nullified them. In 1939 the old Bituminous Coal Commission attempted to determine weighted average costs for bituminous coal, but at that time no final schedule was advanced.

A situation somewhat similar to that of late 1937 again appears likely. Coal prices are being set, serious opposition to the prices is almost a certainty, and, in addition, a case is pending in the Supreme Court of the United States challenging the constitutionality of the 1937 Guffey Coal Act.

The high court on Monday, March 25, agreed to review a case in which the Sunshine Anthracite Coal Company of Arkansas is attacking the validity of the Guffey Act, particularly the tax (19½ percent) which it provides shall be levied on coal sold by producers who do not comply with the terms of the act nor the price schedules and marketing rules set up thereunder.

The Administration did not oppose the Sunshine Company's petition for a review, indicating that it desires the settling of the constitutional question. A previous appeal by the Sunshine Company, based on the contention that the company's coal was anthracite and not bituminous, had been dismissed by the high court.

Just what decision the Supreme Court will hand down in this case is a matter of guesswork at the present time. Prior to the Roosevelt appointments to the court, there is little doubt but what the court would have thrown out the taxing provisions as unconstitutional. Precedent for such a decision can be readily found in three major decisions of the court—the first Guffey Act decision, the Schecter decision, and the invalidation of the processing taxes of the AAA Act.

Director Howard A. Gray, of the Interior Department's Coal Division, in a coast-to-coast broadcast on April 1 explained the price-fixing activities of his division. He emphatically denied that the act will lead to Government ownership of coal mines. Concerning this he said:

"With these democratic and judicial approaches to the job, it has been hard for those critics who have no personal interests to serve to find any other fault than the delay which was due to our judicial observance of the mandates of Congress. Even critics who have an axe to grind in protest against having any minimum prices, who think they can make more money without them because of their special situation, have been hard put to it to find fault. Faced with that difficulty, they have invented a story—and I doubt whether they believe it themselves—that this act will lead to Government ownership of the mines. I have never heard anything quite so fantastic in my life. This is a bugaboo raised to frighten the uninformed business man, in my opinion. There has never been any serious thought of Government ownership in the country since 1922, 18 years ago. Only if Government, industry, and labor fail to bring relief to this industry; only if it again hopelessly starves at bankruptcy prices, will there ever be any danger that industry or labor or Government will revive this sort of talk. Barring this calamity, talk of Government

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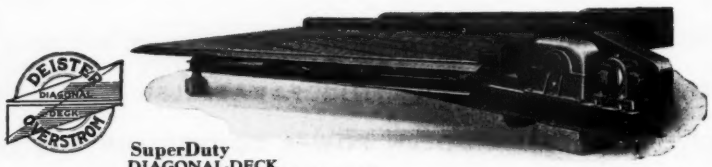

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ownership is out of the picture, and never was in it. I am against that and will always be against it.

"Nothing is in the picture except cementing a foundation under the industry so it doesn't go bankrupt again and repeat the process continuously. There will be nothing else in it until the minimum prices have been in effect long enough for Congress and the industry to decide whether or not the job of helping and saving the industry can be done in this way. I think the industry will never be content until this method of preventing hardship has been given a good honest tryout. It will certainly never agree on anything else unless it has been proved by experience that this is not the best way to operate. I think practically all of the industry will be glad of the chance to see minimum prices work. Even those who do not, for various reasons of their own, want to see these prices work would be wise, I believe, to give the rest of the industry and the nation an opportunity to watch and study the experience for a while."

Only other action of the Division was the announcement of examiners' recommendations for maximum discounts which mine owners can allow to registered coal distributors from the prices when established. The maximum discounts recommended range from 10 to 50 cents a ton, depending upon the size and kind of coal, the district in which it is produced, and the section of the country in which it is sold.

Director Gray announced that he will hear exceptions to these recommendations on April 18 at Washington.

Because of differences in conditions in different parts of the country which affect the selling of coal, the examiners recommended the establishment of zones for the purpose of showing sectional differentials between discounts.

The recommendations also call for a flat discount of 10 cents a ton on coal resold to railroad companies, regardless of kind of coal, where produced, or destination.

Census and Mines Bureau Cooperate in Count

Coal producers will be interested in learning that the Census Bureau. Department of Commerce, and the Bituminous Coal Division, Interior Department, have joined hands in the interest of reducing required statistical reports and curtailing government expenditures for statistical work. Under an agreement signed by the Secretaries of the Commerce and Interior Departments, the 1939 canvass of the bituminous coal mining industry will be conducted cooperatively by these two departments. A joint schedule has been adopted, covering all information needed in carrying out the work of each of these agencies. As stated on the schedule, "the questions are so framed as to supply the data needed for administration of the Coal Act, and at the same time to provide statistics for bituminous coal mining for the sixteenth decennial census."

Under the afore-mentioned cooperative agreement, the Bituminous Coal Division will collect all data and will collaborate with the Census Bureau in editing and publishing information. The joint schedules will be mailed to operators of bituminous mines at an early date. Each operator is requested

to forward his completed schedule to the nearest office of the Bituminous Coal Division. These offices, which are located at strategic points throughout the bituminous regions, will return the questionnaires to Washington.

Separate and distinct questionnaires were mailed to operators in the anthracite regions during January. The survey of these mines is being conducted, as in previous censuses, by the Census Bureau exclusively.

As producers well know, basic statistical information is needed for the administration of the Bituminous Coal Act of 1937. This information includes data on production, transportation routes, equipment, mining methods, costs of production, men employed and days operated. At the same time, an Act of Congress requires the taking of a national census of the coal mining industry covering the year 1939. As the information needed for the administration of the Coal Act is similar in many respects to that needed for the census, the two-purpose schedule was formulated. The arrangement to use a single questionnaire effects savings in government expenditures and reduces the number of statistical reports required of coal operators.

The handling and use of the data reported are strictly governed by Acts of Congress. As expressed on the bituminous coal questionnaire, "the reports to be published will give only composite figures in such a way as not to disclose the operations of individual companies. Employes of the Coal Division are subject to the penalties imposed by Section 10 of the Coal Act for unauthorized disclosure of confidential data. The Act of Congress for the census makes it unlawful to disclose any facts regarding the business of individual companies." Only sworn employes of the Coal Division and the Census Bureau will examine the reports.

Missouri Mineral Industries Conference

The second Missouri Mineral Industries Conference will be held on the campus of the School of Mines at Rolla, Mo., on April 26 and 27. The supper on the evening of April 26 will be an open joint meeting of the St. Louis and Tri-State sections of the American Institute of Mining and Metallurgical Engineers with the Missouri School of Mines' Student Chapter of that institute. Principal speaker at the supper will be R. C. Allen, past president of the A. I. M. E., and vice president of Oglebay Norton & Co., who will talk on "New Technical Developments and Their Economic Influence."

Included in the two-day session will be the following addresses:

"Missouri's Interest in the Mineral Industries," by Carl L. Bolte.
"Missouri Coal: Production, Distribution and Economics," by A. R. Stock.
"Coal and Pyrite: Economic Problems," by Kenneth A. Spencer.
"Coal Carbonization: Scientific Knowledge of Coal," by H. A. Curtis.
"Efficient Burning of Coal and the Smoke Problem," by T. C. Cheasley.
"Zinc Economics," by Evan Just.

ASA Mining Committee Elects Officers

Mining standards were reviewed and action taken to start more active work on many of the mining projects at the meeting of the Mining Standardization Correlating Committee of the American Standards Association February 12. Daniel Harrington of the U. S. Bureau of Mines was reelected chairman of the Committee; Lucien Eaton, American Mining Congress, was reelected vice chairman; and Richard Maize, representing the Mine Inspectors' Institute of America, was elected second vice president succeeding Rush N. Hosler who died last year.

E. A. Holbrook, representing the American Association for Labor Legislation; N. P. Rhinehart, representing the Mine Inspectors Institute of America; and G. B. Southward, of the American Mining Congress are the other members of the M.S.C.C. Executive Committee.

A new project on Safety Code for Quarry Operations was recommended to the A.S.A. Standards Council to cover safety provisions for quarry, open pit, and strip mining operations. The recommendation was made following a canvass of the organizations concerned, which indicated that a majority were in favor of the proposed work.

Members of the M.S.C.C. agreed that there is a real need for an up-to-date standard for wire rope to be used in mines and voted to ask the American Mining Congress which is acting as sponsor for the A.S.A. Committee on Wire Rope for Mines (M11) to consider undertaking a revision of this standard.

Hecla Starts Work on Atlas Mine

Hecla Mining Company has started moving in equipment and mine supplies to the Atlas mine at Mullan, Idaho, to begin the work of sinking a new 800-ft. development shaft. This work will be in charge of Ralph W. Neyman, of Osburn, under supervision of L. E. Hanley, president and general manager of Hecla. Under the terms of a purchase agreement made between Atlas and Hecla recently, 51 percent control of Atlas stock will be in the hands of the Hecla Company.

The Atlas property is the largest group of mining claims under one ownership in the mineral belt south of Mullan, comprising 28 patented claims and 30 marginal locations, covering the Atlas mineral zone along the strike for 12,000 ft., from Boulder Creek in Mullan to the Montana divide. In addition to the claim group, the company owns 70 acres of land facing the highway and adjoining the mine workings, which provides an ideal mill site.

About 30 men are employed in getting the shaft under way. The collar will be located 9,000 ft. from the portal of the main Atlas lower tunnel and 200 ft. northwest of the Bird raise, which connects with the old Carbonate Hill workings. The shaft will be sunk 400 ft., where a station will be cut and a crosscut driven to open the three known Atlas veins—the Bird, Nancy and North. The shaft will then be continued to the 800 level, where another crosscut will open the ore zone. Further developments from this point by Hecla will be determined by geological conditions and by ore encountered in the previous development program.

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Willow Grove Mine Disaster

With reference to the explosion of the Willow Grove mine on March 16, near St. Clairsville, Ohio, operated by the Hanna Coal Company, in which 71 miners lost their lives and 113 gained safety through an air shaft almost three miles away from the main entrance, the following open letter, dated April 1, 1940, from R. L. Ireland, Jr., president of the company, has been received:

"To Our Many Sympathetic Friends:

"In the confusion of the early hours of our disaster, many of our friends rendered us assistance in such a quiet, unassuming way that we were not conscious of their presence. Many others, by telephone and personal visit to Willow Grove, offered us assistance.

"Unfortunately, now that things have quieted down, we know we have overlooked many people whom we desire to personally thank, and we are therefore taking this means of doing so.

"Thanks to a loyal organization and the prompt arrival of many well-equipped neighbors, we had more assistance than we could use. Those of you who were present will likewise appreciate the wonderful help we received from the Ohio State Mining Department, U. S. Bureau of Mines, the West Virginia Mining Department, the Ohio State Highway Patrol, the American Red Cross, the Salvation Army, our county officials, and the community in general.

"For all this help we are most sincerely grateful and only regret that we cannot thank each and every one personally.

"Sincerely,

(Signed) R. L. IRELAND, JR.,
President."

Kennecott's Molybdenite Operations

Molybdenite production during 1939 of Kennecott Copper Corporation amounted to 12,055,554 pounds, which included 111,561 pounds produced experimentally at the Braden plant in Chile. The molybdenite content of the ore treated at the Utah and New Mexico properties averaged 0.0354 percent and the recovery 71.31 percent. In contrast the 1938 recovery was 60.08 percent, and in 1937, the first full year of operation, 43.41 percent. The demand for molybdenite was seriously curtailed upon the outbreak of war, and largely as a result thereof the entire production was not sold. Since December the market has been narrowed even more, and there has been a further accumulation of unsold product.

Toward the end of 1938 experimental work was started looking to the recovery of a small varying amount of molybdenite occurring from time to time in the Braden ore. By December, 1939, experimental results were sufficiently favorable to justify the installation of a permanent molybdenite recovery plant which is now in course of erection and should be completed about July 1, 1940. During the year several hundred tons of low-grade molybdenite concentrates were produced in the course of testing work and these will eventually be retreated to make them marketable. From present indications molybdenite production from this property will probably never be large, but should amount to at least 1,500,000 pounds per year when mining and treating 7,000,000 tons of ore annually.

—Evening Star (Washington)

The One Time That Pocahontas Failed!

A.M.C. Utah Chapter Elects Officers

James Ivers, vice president and general manager of Silver King Coalition Mines, was elected governor of the Utah Chapter of the American Mining Congress, at the Chapter's annual meeting held March 11 in Salt Lake City, Utah. Other officers chosen were as follows: W. J. O'Connor, manager of the Utah Department, American Smelting & Refining Company, first vice-governor; F. S. Mulock, vice president and general manager, western operations, U. S. S. R. & M. Company, second vice-governor; Gloyd M. Wiles, vice president and general manager, Park City Consolidated Mines, third vice-governor; and A. G. Mackenzie, secretary and treasurer.

The Executive Committee was elected as follows: James Ivers, chairman; J. O. Elton, O. N. Friendly, D. D. Moffat, F. S. Mulock, W. J. O'Connor, and James W. Wade.

Directors of the Chapter include: J. O. Elton, M. G. Heitzman, Paul H. Hunt, D. D. Moffat, W. J. O'Connor and J. W. Wade (to serve until 1941); E. A. Hamilton, James Ivers, D. MacVichie, J. A. Norden, H. E. Raddatz, J. D. Shilling and G. W. Snyder (to serve until 1942); and O. J. Egleston, Cecil Fitch, O. N. Friendly, Thomas F. Kearns, C. T. Keigley, F. S. Mulock and Gloyd M. Wiles (to serve until 1943).

PUBLICATIONS of INTEREST

U. S. BUREAU OF MINES

Miner's Circular 39. CENTRAL MINE RESCUE STATIONS, by J. J. Forbes and others. 55 pp. 10c.

T. P. 602. INSPECTION AND MAINTENANCE OF MINE HOISTING ROPES, by L. C. Ilsley and McHenry Mosier. 27 pp. 5c.

T. P. 605. EXPERIMENTS ON STRENGTH OF SMALL PILLARS OF COAL IN THE PITTSBURGH BED, by H. P. Greenwald, H. C. Howarth, and Irving Hartmann. 22 pp. 5c.

R. I. 3482. CORRELATION OF ANALYSIS OF COAL WITH THE PRODUCTS OF CARBONIZATION IN EXTERNALLY HEATED RETORTS, by V. F. Parry. 37 pp.

R. I. 3483. PROGRESS REPORTS—METALLURGICAL DIVISION. 35. ELECTROMETALLURGICAL INVESTIGATIONS—RECOVERY OF NICKEL, COPPER, AND PRECIOUS METALS FROM DOMESTIC ORES BY A COMBINED ELECTROTHERMAL AND ELECTROLYTIC METHOD, by J. Koster, R. G. Knickerbocker, O. C. Garst, T. E. Evans, and W. E. Cody. 28 pp.

R. I. 3489. EXPLOSIBILITY OF SEMI-ANTHRACITE, LOW-VOLATILE BITUMINOUS-COAL AND MEDIUM-VOLATILE BITUMINOUS-COAL DUSTS, by H. P. Greenwald. 11 pp.

MISCELLANEOUS

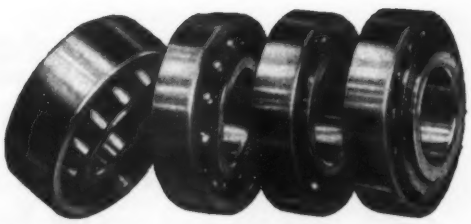
PUBLICATIONS ON THE GEOLOGY, MINERAL RESOURCES, AND MINERAL INDUSTRIES OF ILLINOIS—An index. Illinois State Geological Survey, Urbana, Ill.

PAPERS PRESENTED AT THE FIFTH SHORT COURSE IN COAL UTILIZATION HELD AT THE UNIVERSITY OF ILLINOIS, MAY 23-25, 1939. University of Illinois *Bulletin*, Vol. 37, No. 7. 50c.

CAREERS IN GEOLOGY, published by the Institute for Research, Chicago. $1.00.

MINING ENGINEERING AS A CAREER, published by the Institute for Research, Chicago. $1.00.

INDUSTRIAL MARKET DATA HANDBOOK OF THE UNITED STATES. A cooperative study by the Bureau of Foreign and Domestic Commerce, the Census Bureau and the Bureau of Mines. U. S. Dept. of Commerce, Domestic Commerce Series No. 107.



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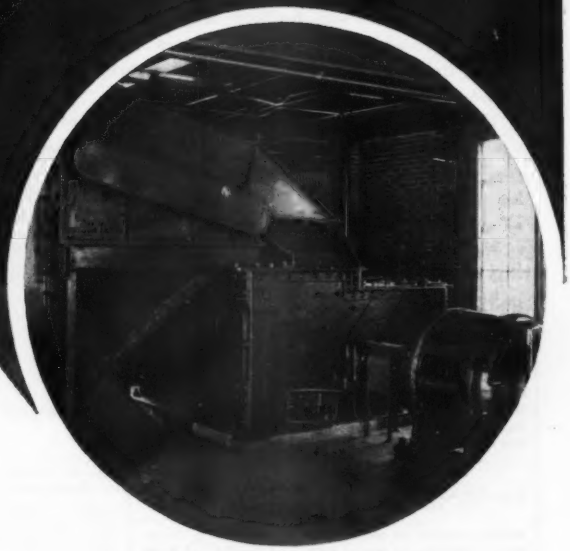

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By selecting SKF's, Pennsylvania obtained bearings with *high capacity* always available for useful work through *inherent rolling alignment* . . . bearings that require neither initial nor subsequent adjustment. They assured their customers of bearings that keep maintenance costs down by keeping the mill always on the job. Call an SKF engineer to obtain "The Right Bearing for the Right Place". 4488

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● Now you can get a true one-man light drifter—the new Gardner-Denver 2¾" bore D73—small in size, but high in performance.

This new D73 weighs little more than a hand-held drill mounted for drifting and uses no more air—but in drilling speed and power of rotation, it is the equal of most 3" drifters.

The greater efficiency of the D73 makes it ideal for use in medium ground, small headings, remote working places, or in locations difficult of access with heavier drills. Powerful, four-pawl rotation gives the D73 unusual ability to rotate in tight or fitchery ground.

We shall be glad to send you a bulletin describing this new D73 Drifter. Write Gardner-Denver Company, Quincy, Illinois.

SPECIFICATIONS

Hammer Diameter	2¾"			
Length of Drill overall, machine only	26"			
Size of Steel, recommended	⅞" to 1¼" Hex., Round or Q. O.			
Size of Air Hose, recommended	¾"			
Size of Water Hose, recommended	½"			
Data with various mountings:	Mtd. on Solid Cone Shell		Mtd. on Movable Cone Shell	
	24"	30"	24"	36"
Weight complete, for collared steel	117 lbs.	120 lbs.	150 lbs.	164 lbs.
Weight complete, for lugged steel	121 lbs.	124 lbs.	154 lbs.	168 lbs.
Weight complete with tappet chuck	127 lbs.	130 lbs.	160 lbs.	174 lbs.
Length of steel change	24"	30"	24"	36"
Additional change with sliding cone	—	—	18"	36"

Weight equipped with Spring Handle for sinking—For Collared Steel, 96 lbs. For Lugged Steel, 101 lbs. For Tappet Chuck, 105 lbs.

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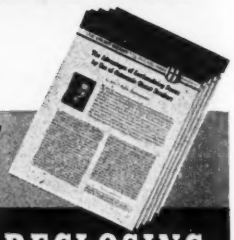

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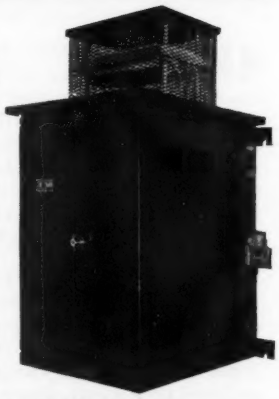
AUTOMATIC RECLOSING CIRCUIT BREAKERS

Raise production; reduce fire hazard; lower maintenance charges; decrease total energy consumption and power demand. These advantages with Automatic Reclosing Circuit Breakers are fully described in I-T-E bulletins based on actual installations in mines.



At right — Each circuit breaker controls a section, confining disturbances to the area in which they arise.

Representatives in Principal Mining Areas

I-T-E CIRCUIT BREAKER CO.
PHILADELPHIA, PA.

PERSONALS

A. W. Thorson has been appointed assistant fuel service engineer for the Chesapeake and Ohio Railway Co., with headquarters in General Motors Building, Detroit, Mich. His appointment became effective February 1.

E. C. Mahan, president of Southern Coal & Coke Co. for 22 years, was recently elected chairman of the board of directors of that company, a newly-created post, and will continue active in management of the coal-selling company. He will be succeeded as president by **W. A. Ellison**, formerly vice president. Both promotions are effective February 1, having been made at a recent meeting of the board of directors held in Williamsburg, Ky.

Robert W. Lahr has been chosen to represent the Phillips Mine and Mill Supply Co. on the Manufacturers Division of the American Mining Congress. Mr. Lahr is manager of sales for that company.

Arthur Ebbert has been elected vice president of the Pennsylvania & West Virginia Supply Corporation, effective February 10.

George B. Baker has been appointed general manager for the Premier Pocahontas Collieries Company, Premier No. 4-9 and Indian Creek mine, at Premier, W. Va.

P. L. Vest, formerly superintendent for the Weyanoke Coal and Coke Company's Arista mine, is now safety inspector for the Lamar Colliery Company, Lamar mine, Lamar, W. Va., and the Winding Gulf Collieries Company's Louisville Nos. 2 and 6 mines at Goodwill, W. Va.

W. A. Haslam is now superintendent of the Pond Creek Pocahontas Company's No. 1 mine.

J. M. Holbrook was recently named superintendent of the Pond Creek Pocahontas Company's No. 4 mine.

Dr. A. S. Walter, dean of mining and metallurgy at the New Mexico School of Mines, was elected president of the New Mexico Miners and Prospectors Association at the annual meeting of the organization held January 20 in Albuquerque. **C. S. Elayer**, superintendent of the Ground Hog unit of the American Smelting and Refining Company at Vanadium, was chosen vice president, and **R. M. Twiss**, also of Vanadium, was named secretary-treasurer.

John Van Nostrand Dorr, president of The Dorr Company and associated companies in the United States and abroad, was one of the 19 inventors and research scientists who received awards as national modern pioneers by the National Association of Manufacturers at ceremonies held in New York commemorating the 150th anniversary of the founding of the U. S. Patent system. Mr. Dorr's award was made as a recognition of his invention of machines and processes for ore treatment and municipal sanitation.

Dr. Wm. A. Mudge has joined the technical staff of the technical survey division of the International Nickel Company in New York City. For the past 17 years Dr. Mudge has occupied various responsible positions at the company's rolling mill at Huntington, W. Va.

Leverett Davis has resigned as vice president in charge of operations of Cornucopia Gold Mines to devote his time to the operation of properties he has acquired personally. Most important of these is the Simmons group near Cornucopia, Oreg., which has a substantial tonnage of proven ore, and Mr. Davis anticipates that he will have it in production some time this summer.

Mr. Davis is a member of the Board of Governors of the Western Division of The American Mining Congress.

Dr. Alfred K. Snelgrove, secretary of the Department of Geology at Princeton University and of the Princeton Geological Association, has been appointed head of the Department of Geology and Mineralogy at Michigan College of Mining and Technology, Houghton. Dr. Snelgrove, who will assume his new duties beginning with the fall term, is a specialist in geology of his native Newfoundland, and for several summers has led Princeton geological expeditions to that locality. In 1934 he was appointed consulting government geologist for that Dominion.

William Adams Kissam, president and treasurer of the South American Development Company, announces the removal of his office to Suite 910, 75 West Street (between Carlisle and Rector Streets), New York City. His offices formerly were at 19 Rector Street.

John C. Cosgrove, consulting engineer of Johnstown, Pa., has been retained by the Peerless National Pottery, Inc., Evansville, Ind., as consulting engineer to assist them in modernizing their plant, equipment and practices.

Frederick G. Hughes, general manager of the New Departure Division, General Motors Corporation, was among 13 Connecticut inventors presented "modern pioneer" scrolls of achievement by Governor Raymond E. Baldwin, February 16, at a dinner given in the Hartford Club, Hartford, in recognition of outstanding patented inventions which have contributed to the nation's welfare. His recognition came as the result of Mr. Hughes' patents on pre-loaded ball bearings and their applications.

Dr. John W. Finch has opened an office at 25 Broadway, New York City, where he will engage in mine consulting work.

William C. Johnson has been made sales manager of the Crushing and Cement Machinery Division of the Allis-Chalmers Manufacturing Company. Mr. Johnson, until recently manager of the company's Knoxville, Tenn., district office, will now have charge of all sales activities of his division, both in the home office and in the field.

Carroll B. Huntress, eastern sales manager of Republic Coal and Coke Co., presented the negative side of the question, "Should the St. Lawrence Seaway-Power Treaty Be Ratified?" in a debate at the Town Hall of Buffalo, N. Y., March 9. In a forceful argument, he said, in part: "The coal market stands to lose a minimum of 30 million tons and quite conceivably the figure would reach 50 million or more, as follows: At least five million to water power; ten million to British, Russian and other coals, produced in

a post-war Europe, where man will labor for a slice of bread, and shipped as ballast, which would capture our Canadian market; from 15 to 30 million tons to foreign coals, duty free, and to foreign oils to which our vast inland market would be exposed; and a large volume due to reduced railway fuel consumption, caused by reduced train movement. Translation of that lost tonnage into unemployment figures shows that nearly 100,000 people, with payrolls exceeding a hundred million dollars, engaged largely in the mining and distribution of coal, including thousands of railroad workers, would lose their jobs in New York State and in the mining fields of West Virginia and Pennsylvania. That's why those railroad men protested in Albany last week. That's why government competition is unshirted hell."

J. J. Morris has been promoted from mine electrician to chief electrician of the Kayford, W. Va., district for the Truax-Traer Coal Company. Mr. Morris has been active in the classes of the West Virginia University mining extension department in that field for several years.

Samuel H. Dolbear, president of Wright, Dolbear & Co., consulting mining engineers, has been elected a trustee of Clark University at Worcester, Mass.

Walter L. Maxson has been appointed sales manager and chief engineer of the Mining Machinery Division of Allis-Chalmers Manufacturing Company, according to an announcement made by **Herman Schiffin**, manager of the company's Crushing, Cement and Mining Machinery Department.

For many years a sales engineer of the Mining Division, Mr. Maxson will now have charge of all sales activities of his division, both in the home office and in the field. As chief engineer, he will be in charge of all engineering in this division.

George A. Lamb has been appointed acting chief of the research section of the Bituminous Coal Division, succeeding the late **Dr. Frederick G. Tryon.** While Mr. Lamb's designation has been made pending the selection of a permanent successor, Interior Department officials indicate that he probably will be given the permanent appointment as a natural successor of Dr. Tryon, whose assistant he was for several years. He is therefore intimately familiar with the character and scope of the Coal Division's statistical work and the methods used in carrying it on.

Roland D. Parks, associate professor of mine engineering at Michigan College of Mining and Technology, Houghton, Mich., has resigned from the Michigan Tech staff to join the faculty of Massachusetts Institute of Technology in Boston. He will teach courses at M. I. T. in mining engineering, with emphasis on mining economics and mine valuation.

A. H. Woodward was reelected Chairman of the Board of the Woodward Iron Company, Woodward, Ala., at the annual meeting of the directors. Other officers renamed are: **H. A. Berg**, president; **R. M. Marshall**, vice president and secretary, and **D. T. Turnbull**, assistant secretary-treasurer.

R. E. Howe, president of Appalachian Coals, Inc., has accepted appointment as a member of the committee on principles of Americanism of the National Association of Manufacturers.

L. E. Hanley, of Wallace, Idaho, has been elected president and general manager of the Hecla Mining Company, and **Leo J. Hoban**, secretary of the company, is now on the Board of Directors. Both men have been with the company in executive positions for many years.

L. E. HANDLEY

Mr. Hanley succeeds **James F. McCarthy**, deceased, who had served the company as president and general manager for 29 years. Mr. Hanley joined the company in 1903 as assayer and bookkeeper, and has worked up through every department of the Hecla organization. In 1923 he was appointed general mine superintendent, and has held that position ever since.

—*Obituaries*—

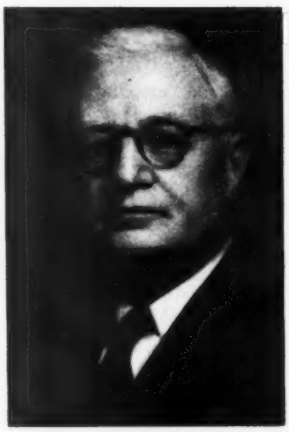
Dr. Louis G. Ricketts, distinguished mining and metallurgical engineer, died March 4 in Pasadena, Calif., at the age of 80.

Dr. Ricketts, whose reputation was international, was a director of the Phelps Dodge Corporation, Anaconda Copper Mining Company, Inspiration Consolidated Copper Company and Cananea Copper Company. He was particularly famous for designing and constructing large concentrating and smelting plants, including leaching plants, principally in the copper division of the mining industry. He was the recent recipient of the James S. Douglas medal of the American Institute of Mining and Metallurgical Engineers for "inspirational leadership and distinguished achievements in the metallurgy of copper."

Arthur Hale, chief executive of the Coal Exporters Association of the United States, died suddenly February 29, at Washington, D. C., following a heart attack. He was over 80 years of age, and had been active until a few days preceding his death. Mr. Hale had been connected with the American Wholesale Coal Association and its successor, the American Coal Distributors Association, since 1921; was secretary of the Wholesale Coal Code Authority under the NRA, and chairman of the executive committee of Tidewater Coal Exchange.

Daniel B. Wentz, Jr., prominent young Philadelphia coal operator, died in Philadelphia of leukemia, March 9, at the age of 36. He was president of the Virginia-Kentucky Coal Corporation, vice president of the General Coal Company, the Stonega Coke & Coal Company, the Virginia Coal & Iron Company, the Wentz Corporation, the Westmoreland Coal Company, the Westmoreland Inc., and director of the Admiralty Coal Corporation, the Crab Orchard Improvement Company, the Wentz Company and the White Horse Cement Manufacturing Company.

James F. McCarthy, president of the Hecla Mining Company, at Wallace, Idaho, died March 6 at the age of 73. Mr. McCarthy had held the position of president of Hecla since 1910, and had been identified with the



organization since 1903; he was prominent not only in the development of the Hecla, but of the Star and Polaris mines, together with the Sullivan electrolytic zinc plant near Kellogg.

John Richards, mine superintendent, and **Howard Sanders**, tipple foreman, of the Hanna Coal Company's Willow Grove mine at St. Clairsville, Ohio, were killed by gas when they rushed into the mine without masks shortly after the explosion on March 16.

THE CHINESE WERE WRONG ABOUT THIS

That old Chinese adage about one picture being worth ten thousand words doesn't apply to Deltabeston Wires and Cables. *It takes more than a mere illustration to describe Deltabeston's outstanding features.*

The new Deltabeston Mine Locomotive Rewiring Cable is a case in point. You can actually SEE the flexible copper conductor, the Glyptal Cloth insulation, asbestos tape and overall asbestos braid. BUT, THOSE THINGS DON'T FULLY EXPLAIN HOW THIS NEW CABLE WILL HELP YOU.

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Here are some of the *hidden assets* that make Deltabeston Mine Locomotive Rewiring Cable dependable—easy to use. Insulation won't deteriorate in the face of extreme heat—won't absorb moisture. Glyptal Cloth is resistant to oils, gasoline, acids and alkalies. Overall asbestos braid is flameproof—impregnated with weather- and moisture-resisting compound. Carefully-chosen soft copper conductor is extra flexible.

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The best way in the world to PROVE the advantages of Deltabeston Mine Locomotive Rewiring Cable is to use it for rewiring mine and industrial locomotives—on trolley, motor and resistor leads. The second best way is to examine a sample. Mail the coupon, today.

A complete line of Deltabeston Wires and Cables is distributed by General Electric Merchandise Distributors and Graybar Electric Company. All types are constructed with heat-resisting insulations.

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General Electric Company, Bridgeport, Conn.

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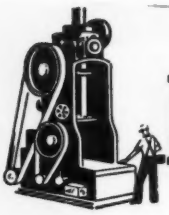
( ) Facts about Deltabeston and Deltaglass Magnet Wires
( ) Complete Deltabeston Wire and Cable Catalog

Please write your name, company and address in the margin and mail!

GENERAL ELECTRIC

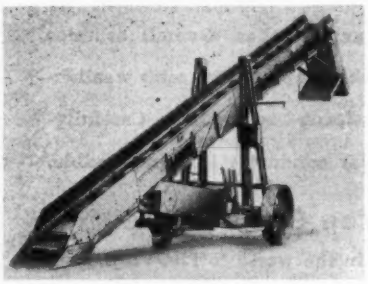


MANUFACTURERS' Forum

New Type Scraper Loader

A new portable loader for handling all sizes of coal and coke has been recently announced by the Jeffrey Manufacturing Company, Columbus, Ohio. Designed to load from railroad cars to ground storage or direct to truck, it will also load 4-in. cube sizes and under from ground storage to trucks at a capacity of 1 ton or more per minute. This unit does a better than average job on large lump coal, which is more difficult to load mechanically.

Three standard lengths—25, 30, and



35 ft. centers with power moving—power raising and lowering. Weight of 30-ft. machine is exactly 3 tons. Overall height of mast, 10 ft.; overall width of machine, 7 ft. 6 in. Special new and advanced features include: Self-adjusting steel crowding shoes at foot end; ball-bearing mounted, self-adjusting center wheel with 6-in. oval face permits lifting the crowding end of machine clear of ground for short quick turns; drive wheels—½ in. thick by 8 in. wide steel rims—¼ in. high channel-type cleats, pneumatic-tired wheels can be furnished; and a wide range raising and lowering device, with minimum discharge height 6 ft., and maximum 15 ft. 6 in.

Synthetic Coating Protects Belt Covers

Conveyor installations, on which conveyor belting is used, are often idle for considerable periods. During this idleness, belting covers may suffer greater deterioration through the effects of sunlight and air than when the belting is in use. This deterioration also takes place when belts are in storage.

One of the large steel companies, with extensive conveyor installations, had been studying this problem of deterioration, and approached The B. F. Goodrich Company, Akron, Ohio, for cooperation.

As a result of research into the merits of various compositions, Goodrich is now offering a new synthetic coating for belting covers, which, on the basis of its tests, will greatly reduce the effects of aging. Samples of conveyor belting with covers under severe tension were coated with the synthetic composition, and exposed for six months to all varieties of weather. At the end of that period none of the samples of belting on which the new coating had been applied showed any evidences of cover deterioration.

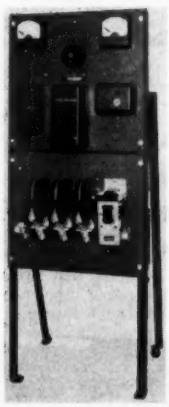
The new product has been designated as Goodrich R-60-T protective coating for conveyor belting.

Portable Lamp Representative

The Portable Lamp & Equipment Co., 77 First Avenue, Pittsburgh, Pa., recently placed Mr. John Thies in charge of sales in the Alabama district. Mr. Thies is entirely familiar with the Alabama field, having represented Portable there several years ago. More recently he has been located in Indiana for the company. In the future, he will be in position to supply any of the well-known Portable personal protective products, many of them from the Birmingham stock. His address is 1536 41st St., Belview, Birmingham, Ala.

Synchronous Motor Control

A new synchronous motor control featuring the slip-cycle impedance SCI relay developed by General Electric permits the device that allows accurate control of synchronizing speed, so that the field cannot be applied until the motor has reached a speed at which it can synchronize its load. This speed is easily set on a trial start by an adjusting screw on the front of the relay. Undesirable current and torque fluctuations are avoided, because field can in no case be applied unless the load can be synchronized.

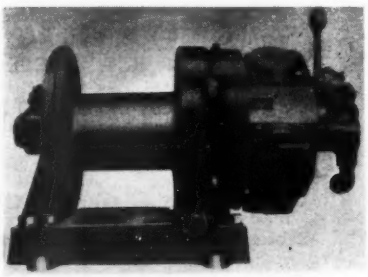


This control waits until motor reaches the correct speed, and then selects an instant of favorable angular relation of stator and rotor poles to apply field in order to take advantage of the inherent synchronizing ability of the motor. The SCI relay also prevents pulsations in case of motor pull-out by promptly disconnecting the power (or field if automatic resynchronization is desired). Protection of the squirrel-cage winding during starting and the stator winding during running is provided by separate relays which match the widely different characteristics of the two windings.

This system of field application is available for control of all ratings of synchronous motors. Magnetic or semimagnetic forms are available for full voltage, reduced voltage, or part-winding starting.

Radial Air Motor Features Air Hoist

"Smoother torque than a straight 8" is what Gardner-Denver officials say about the 5-cylinder radial air motor used to power their new line of single and double drum air hoists. The overlap of power impulses of this



motor exceeds that of a modern 8-cylinder automobile engine. Engineers report that at low speeds, when the flywheel action is negligible, its smooth action is particularly noticeable. Although the motor is new in use on air hoists, it has been proved in use on Gardner-Denver mine-car loaders.

As described in the new Gardner-Denver Bulletin H-1, the new hoists have smaller overall dimensions and less weight per horsepower delivered than any other hoists of their type. They are very well adapted to hoisting, hauling, dragging or scraping in mines, smelters, quarries, highway and construction work.

Other features which distinguish these hoists are safety design which makes it impossible to drop a load accidentally; powerful brake bands with conveniently located operating

lever; hardened gears accurately cut and running in oil; entirely sealed gear train that absolutely prevents dirt and water from reaching any gears or bearings; sealed-in oiling system that insures proper lubrication without the need for constant watchfulness on the part of the operator; simple three points of lubrication takes care of all moving parts; throttle lever is self-centering with automatic safety latch to hold it in neutral position.

Full details will be furnished upon request by writing Gardner-Denver Company, Quincy, Ill.

Welded Steel Refuse Kettles

The Treadwell Construction Company, Midland, Pa., has recently introduced a line of welded steel refuse kettles suitable for use in smelting, refining, steel, chemical and other industries. They are made of special fire-box quality and are of all-welded construction.

These kettles have a rated capacity

of 19½ cubic feet. The inside diameter at the top is 42 inches and the inside depth, 24 inches. The top flange, 1½ inches thick, is slotted to receive swing bolts. The bottom of the kettle is a standard A. S. M. E. ellipsoidal head of ⅝-inch thick plate. The kettles are so designed and the inside contour is such as to assure self-clearing when the kettle is dumped.

The manufacturer will gladly furnish complete information on request.

Faceshields

Announced by the Mine Safety Appliances Company is a new line of faceshields for which important advantages in design and construction are claimed.

Intended for use on jobs where goggles are not absolutely required, yet protection to the face desirable, the M. S. A. faceshields are said to afford comfortable protection against hot sparks, chemical splashes, flying grit and dust, etc., and are available in three models: Without sparkshield, with semi-sparkshield, and with full sparkshield.

Preformed headgear, which conforms to the natural contours of the back of the wearer's head—as distinguished from ordinary oval "hatband" construction—is a feature stressed by the manufacturer, as is the headgear's center top strap, which supports the light weight of the shield without pressure on sides of head—the three-way, full headgear adjustment, finger control of friction adjustment permitting easy visor movement, and the aluminum binding of visor edge, which extends around the entire edge and greatly increases durability.

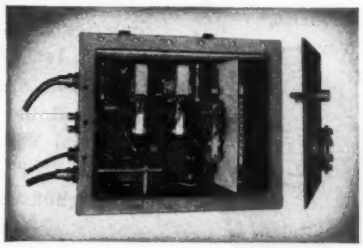
The visor, which may be pushed upward and back on top of the head at will, is stated to be made of the best commercially available plastic in 4, 6, and 8 in. sizes, in green as well as clear. Easy and inexpensive replacement of all unit parts is stressed. The headgear is constructed of high-quality moisture-resistant fibre, and sweatbands are genuine leather.

The maker declares that the M. S. A. faceshields are stronger, more durable, and notably more comfortable to wear, due to their advanced engineering design. Complete details regarding the line are contained in the company's Bulletin No. CE-11, your copy of which may be obtained free on request to this publication or direct to Mine Safety Appliances Company, Braddock, Thomas and Meade Streets, Pittsburgh, Pa.

Explosion-Proof Automatic D. C. Motor Starter

The Ohio Brass Company, Mansfield, Ohio, announces development of an explosion-proof automatic d. c. motor starter for conveyor, fan, pump and compressor work in gaseous mine atmospheres. Designated as the Type ADG explosion-proof starter, this device controls and protects d. c. motors from 2 to 50 hp. operating at voltages of 250 and 600. Push-button, remote push-button or remote float switch control arrangements are available.

Overload and short circuit protection are provided by a line contactor fitted with a thermal element adjust-



able for a wide range of timed overloads. When the line contactor trips and the motor stops because of short circuit or overload, the overload armature latch must be reset by the operator before the motor can be restarted. This can be done from the outside of the gasproof steel case by means of a spring-operated push-button.

The case itself is fabricated of heavy steel plate, welded and tested for airtightness. A ground joint between the case and the cover, which is bolted on by bolts placed at short intervals, provides a flameproof seal. Cable outlets and push-button stations are watertight and flameproof. A convenient handhole for replacing fuses and making adjustments in the field is provided in the cover. The handhole door is screwed to the door frame with six standard V-threads, confining any possible explosion to the interior of the case.

Wound-Rotor Motors

Of special sturdy construction to withstand hard service on metal rolling mills, hoists, and similar applications, newly designed pedestal-type wound-rotor induction motors in 250- to 5,000-hp. sizes are announced by the Westinghouse Electric & Manufacturing Company. The motors are built to withstand conditions where high starting torque, frequent starts and stops, reversing service, and abnormally high peaks are common requirements.

Necessary strength and rigidity of the stator are obtained through a box-type cast-iron frame or a fabricated steel frame, with supporting feet near the horizontal center line of the frame. The feet have screws and liners for horizontal and vertical adjustment, so the stator can be moved in any direction to line up the air gap and compensate for bearing wear.

To withstand electrical strains, the rotor coils are insulated for double voltage. A special Westinghouse feature, partially closed slots, and form-wound coils similar to those used in fully open slot construction are built in. The rotor coils are made of two straps side by side, each strap formed to exact shape and completely insulated before assembly. This construction gives a high power factor without the disadvantage of a small mechanical air gap, and permits use of completely formed and insulated coils.

Pumps

"100,000 Raindrops from Underground for 1 cent" is the title of an interesting new pamphlet featuring various types of deep well water pumps. It shows open section views of Peerless turbine pumps, oil and water lubricated; also the new Peerless hi-lift pumps in which a helical rotor lifts water by a new principle. A copy may be obtained by writing to Peerless Pump Company, 301 W. Avenue 26, Los Angeles, Calif.

PETER F. LOFTUS

Consulting Engineers

ENGINEERING AND ECONOMIC SURVEYS, ANALYSES AND REPORTS ON POWER APPLICATIONS AND POWER COST PROBLEMS OF THE COAL MINING INDUSTRY

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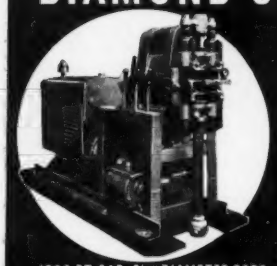

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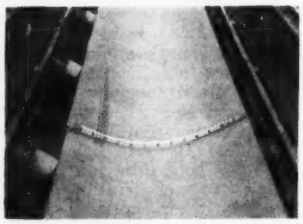
for



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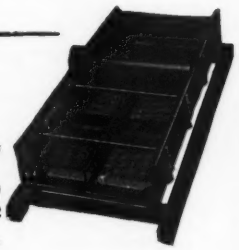

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INDEX TO ADVERTISERS

	Page
American Brattice Cloth Corporation	23
American Chain & Cable Co., Inc. American Cable Division	Third Cover
Anaconda Wire & Cable Co.	81
Bethlehem Steel Co.	18
Brown-Fayro Co., The	80
Cardox Corporation	12-13
Cincinnati Hotels Association	88
Deister Concentrator Co., The	84
DuPont de Nemours & Co., Inc., E. I.	16
Edison, Thos. A., Inc.	Front Cover
Electric Storage Battery Co., The	26
Gardner-Denver Co.	88
General Electric	4-5
General Electric Co. (Bridgeport)	91
Goodman Manufacturing Co.	8
Hercules Powder Co.	79
Hoffman Bros. Drilling Co.	94
I-T-E- Circuit Breaker Co.	88
Jeffrey Manufacturing Co.	19, 20, 21 & 22
Johnson-March Corp., The	15
Joy Manufacturing Co.	6-7
Koppers Company Koppers-Rheolaveur Wood Preserving Corp., The	Insert between 18-19
Link-Belt Company	3
Loftus, Peter F.	92
Metal & Thermit Corp.	Second Cover
Mine Safety Appliances Co.	Back Cover
Mott Core Drilling Co.	94
Ohio Brass Co.	10-11
Pennsylvania Drilling Co.	94
Pure Oil Co., The	85
Roberts & Schaefer Co.	9
Robinson Ventilating Co.	94
Roebling's Sons Co., John A.	17
SKF Industries, Inc.	87
Superior Carbon Products, Inc.	23
Talcott, Inc., W. O. & M. W.	94
Templeton, Kenly & Co.,	73
Timken Roller Bearing Co., The	77
Universal Vibrating Screen Co.	94
U. S. Rubber Co.	24-25
Westinghouse Electric & Manufacturing Co.	83

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